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BATTLE COMMAND STAFF TRAINING

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LTG, USA (Ret.)

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The objective of this study is to develop and design a new simulation-based intensified training readiness strategy for the Reserve Component. The strategy intends to create an order of magnitude improvement in the effectiveness and efficiency of Reserve Forces training. Measures of success were postulated to be the ability to compress one week of pre-mobilization summer training into one weekend or sixty days of post mobilization training into fifteen to thirty days--both by 1998. This is the second part of the overall study. It addresses Battle Command Staff Training (BCST) at the Battalion and Brigade levels. The scope of the first study (IDA Paper P-2611) was limited to one application, U.S. Army National Guard armor units, Company and below, a substantial reserve readiness training issue of Desert Shield. The approach here is to hypothesize training policies and programs for the Army National Guard which will ensure trained combat unit staffs for the Guard concurrent with DARPA development of the technologies necessary for competent execution of the proposed training strategy to standard by average units distributed across the United States. The study proposes a new model for BCST. It discusses General Principles to guide development, structuring of the After Action Review (AAR), design of BCST Tables and Modules, preparation of the unit for BCST, training of individual staff officers and small staff teams, and potential application of the training strategy to institutional training.

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Frederic J. Brown, Ph.D.
LTG, USA (Ret.)

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INSTITUTE FOR DEFENSE ANALYSES

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INTRODUCTION

This study was commissioned to develop an innovative prototype for training battle staff synchronization using advanced distributed simulation. All too often, technologies are developed and fielded without sufficient insight into how the given technology can contribute value to the user. This study examines the issues associated with battle command staff training as a whole, and proposes innovative ways to use advanced distributed simulation to hopefully enhance performance. As the reader will rapidly discover, the issues are much more pervasive than how to use one or more simulation technologies. The study addresses contemporary issues like:

- What are the critical tasks of a battle staff?
- What is necessary in the world of joint and coalition warfare?
- How does one develop training exercises to exploit this medium?
- What are some of the implications for institutional training?

The DARPA/ARNG Advanced Distributed Simulation Program is designed to "invent" new ways to train through the use of advanced technology and innovative training development and research. The DARPA/ARNG program team will use this excellent report and other sources of input in order to develop and test alternative ways to train ARNG units in battlefield synchronization.

It is hoped that this report will open a professional debate and study of this area of collective performance. There are a variety of ideas that need attention, ranging from how staffs should operate vertically, how to measure staff performance, how to diagnose performance, and how to prepare and remediate personnel for realistic simulation training. It is further hoped that the lessons learned from the experiments conducted based upon this work will be applicable in a wide variety of services and components.

Steven L. Funk, Ed.D.
COL, GS, ARNGUS
Program Manager

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CONTENTS

Introduction iii

Figures vii

Abbreviations ix

Executive Summary S-1

1. GENERAL PRINCIPLES 1-1
 - The After Action Review 1-7
 - Tactical Tables 1-9
 - Unit Preparation to Conduct the Training 1-11
 - Supporting Individual and Small Group Training 1-15
 - Implications for Institutional Training 1-17
 - Summary 1-18
 - Conceptual Innovation in BCST 1-19

2. THE AAR 2-1
 - AAR Training Development 2-1
 - Tasks for Battle Command Staff Training 2-5
 - MOP/MOE Development 2-7
 - AAR Training Support 2-9
 - The Objective AAR 2-10

3. BCST TABLES 3-1
 - Table Training Scenarios 3-2
 - Tables for the Proof of Principle 3-5
 - Setting the Context 3-8
 - Table Training Support 3-10

4. UNIT PREPARATION TO CONDUCT THE TABLE TRAINING 4-1
 - Command Pretrain 4-1
 - Preparation of the Training Plan 4-6
 - General Guidance for the Battalion TF Training Program 4-11

Training Support 4-12
Preparation for Vertical BCST 4-15

5. SUPPORTING INDIVIDUAL AND SMALL GROUP TRAINING 5-1
The Training Model 5-3
Training Support Requirements 5-9
Training Development 5-10

6. IMPLICATIONS FOR INSTITUTIONAL TRAINING 6-1
Development Guidance 6-3
Preparation of OCs and OEs 6-8
Development of Institutional Tables and Modules 6-10

7. CONCLUSIONS AND RECOMMENDATIONS 7-1
Conclusions 7-1
Recommendations 7-5

APPENDIXES

Chapter 1 Appendixes
Appendix 1.1-- Battle Command Staff Tables, IDA Paper P-2611 1.1-1
Appendix 1.2-- Vertical BCST--Fire Support 1.2-1
Appendix 1.3-- Conceptual Innovations in Battle Command/Staff Training (BCST) 1.3-1

Chapter 2 Appendixes
Appendix 2.1-- AAR Training Development 2.1-1
Appendix 2.2-- Tasks for Battle Command Staff Training 2.2-1
Appendix 2.3-- MOP/MOE Development 2.3-1
Appendix 2.4-- AAR Training Support 2.4-1
Appendix 2.5-- The Objective AAR 2.5-1

Chapter 3 Appendixes
Appendix 3.1-- Table Training Scenarios 3.1-1
Appendix 3.2-- Tables for the Proof of Principle 3.2-1
Appendix 3.3-- Setting the Context 3.3-1
Appendix 3.4-- Table Training Support 3.4-1

Chapter 6 Appendix
Appendix 6.1-- Requirements for BCST in Institutional Training 6.1-1

FIGURES

1-1. National Guard Intensive Training Matrix 1-6

1-2. AAR: Compare "Your Way" to "A Way" 1-10

1-3. Development of BCST Tables..... 1-12

4-1. Training Alternatives 4-10

ABBREVIATIONS

AAR	After Action Review
ABS	Advanced Battle Simulation
AC	Active Component
ACA	Airspace Coordination Area
ACCES	Army Command and Control Evaluation System
ADA	Air Defense Artillery
AFATADS	Advanced Field Artillery Tactical Data System
AFOR	Automated Forces
AFV	Armored Fighting Vehicle
ALB	Airland Battle
ALO	Air Liaison Officer
ALOC	Air Line of Communication
ARI	Army Research Institute
ARNG	Army National Guard
ARTBASS	Army Training Battle Simulation System
ARTEP	Army Training and Evaluation Plan
ATACMS	U.S. Army Tactical Missile System
ATGM	Antitank Guided Missile
ATO	Air Tasking Order
BBS	Brigade/Battalion Simulation
BCST	Battle Command/Staff Training
BCTP	Battle Command Training Program
BDA	Battle Damage Assessment
Bde	Brigade
BMO	Battalion Motor Officer
Bn	Battalion
BOS	Battlefield Operating System
BSE	Battle Staff Effectiveness
BSI	Battle Staff Integration

CAC	Combined Arms Command
C&GSC	Command and General Staff College
CAS	Combined Arms and Services
CATS	Combined Arms Training Strategy
CATTC	Combined Arms Tactical Training Center
CBS	Corps Battle Simulation
CCTT	Close Combat Tactical Trainer
CFA	Covering Force Area
CFX	Command Field Exercise
CINC	Commander in Chief
CMTC	Combat Maneuver Training Center
Co	Company
COLT	Combat Observation/Lasing Team
CONUS	Continental United States
CP	Command Post
CPX	Command Post Exercise
CSS	Combat Service Support
CTC	Combat Training Command
DARPA	Defense Advanced Research Projects Agency
DISCOM	Division Support Command
DIVARTY	Division Artillery
DP	Decision Point
DRT	Division Reconnaissance Team
DS	Direct Support
EAC	Echelons Above Corps
FASCAM	Field Army Support Command
FCX	Fire Coordination Exercise
FEBA	Forward Edge of the Battle Area
FIST	Fire Integration Support Team
FORSCOM	U.S. Army Forces Command
FPF	Final Protective Fire
FRAGO	Fragmentary Order

FSB	Fire Support Base
FSO	Fire Support Officer
GSR	Ground Support Radar
HE	High Explosive
HHC	Headquarters and Headquarters Company
IDT	Inactive Duty Training
IEW	Intelligence/Electronic Warfare
IFOR	Intelligent Forces
IPB	Intelligence Preparation of the Battlefield
JAAT	Joint Air Attack
JESS	Joint Exercise Simulation System
JRTC	Joint Readiness Training Center
JSEAD	Joint Suppression of Enemy Air Defense
LD	Line of Departure
MACOM	Major Command
MBA	Main Battle Area
MCC	Military Communications Central
METL	Mission Essential Task List
METT-T	Mission, Enemy, Troops, Terrain, and Time
MILES	Multiple Integrated Laser Engagement System
MOE	Measures of Effectiveness
MOP	Measures of Performance
MRC	Motorized Rifle Company
MRR	Motorized Rifle Regiment
MTP	Mission Training Plan
MUTA	Multiple Unit Training Assembly
NAI	Named Areas of Interest
NBC	Nuclear, Biological, and Chemical

NFA	No Fire Area
NGB	National Guard Bureau
NTC	National Training Center
OAC	Officers Advanced Course
OC	Observer/Controller
OCI	Observer/Controller for Information Processing
OCT	Observer/Controller for Tactics
OE	Organizational Effectiveness
OESO	Organizational Effectiveness Staff Officer
OPFOR	Operational Force
OPORD	Operations Order
ORLL	Operations Report Lessons Learned
PCC	Pre-Command Course
POI	Program of Instruction
POM	Presidio of Monterey (ARI Field Unit)
POP	Proof of Principle
PVD	Plan View Display
RC	Reserve Component
RG	Readiness Group
RTD	Resident Training Detachment
S-1	Battalion Adjutant, Personnel Officer
S-2	Battalion Intelligence Officer
S-3	Battalion Operations and Training Officer
S-4	Battalion Supply Officer
SAFOR	Semiautomated Force
SAMS	School of Advanced Military Studies
SEAD	Suppression of Enemy Air Defense
SME	Subject Matter Expert
SOP	Standing Operating Procedure
STP	Staff Task Proficiency
STX	Situational Training Exercise

T&EO	Training and Evaluation Outline
TAG	The Adjutant General
TAI	Target Areas of Interest
TCDC	Tactical Commanders Development Course
TEA	Tactical Effective Analyses
TES	Tactical Engagement Simulation
TEWT	Traditional Exercise Without Troops
TF	Task Force
TOC	Tactical Operations Center
TOE	Table of Organization and Equipment
TRADOC	U.S. Army Training and Doctrine Command
TSD	Training Support Detachment
UCOFT	Unit Conduct of Fire Trainer
UMCP	Unit Maintenance Collection Point
UPAS	Unit Performance Assessment System
USAFAS	U.S. Army Field Artillery School
USAR	U.S. Army Reserve
USAARMS	U.S. Army Armor School
UTA	Unit Training Assembly
XO	Executive Officer

EXECUTIVE SUMMARY

The objective of this study is to develop and design a new simulation-based intensified training readiness strategy for the Reserve Component. The strategy intends to create an order of magnitude improvement in the effectiveness and efficiency of Reserve Forces training. Measures of success were postulated to be the ability to compress one week of pre-mobilization summer training into one weekend or sixty days of post mobilization training into fifteen to thirty days--both by 1998.

This is the second part of the overall study. It addresses Battle Command Staff Training (BCST) at the Battalion and Brigade levels.[1] The approach is to hypothesize training policies and programs for the Army National Guard which will ensure trained combat unit staffs for the Guard concurrent with DARPA development of the technologies necessary for competent execution of the proposed training strategy to standard by average units distributed across the United States.

The study proposes a new model for BCST. It discusses General Principles to guide development, structuring of the After Action Review (AAR), design of BCST Tables and Modules, preparation of the unit for BCST, training of individual staff officers and small staff teams, and potential application of the training strategy to institutional training.[2]

Three practical guidelines are proposed to guide development. They are:

Tables (Modules) are required to enable distributed training to prescribed individual and team (staff) competency as defined by performance on Measures of Performance (MOP) and Measures of Effectiveness (MOE).

1 The scope of the first study (IDA Paper P-2611) was limited to one application, U.S. Army National Guard armor units, Company and below, a substantial reserve readiness training issue of Desert Shield.

2 The Paper is designed to reflect increasing detail according to the needs of the various readers. Chapter 1 summarizes the entire effort. Chapters 2 to 6 expand the discussion of the various elements of the proposed model: AAR, Tables, etc. Appendices to each Chapter describe in considerable detail "how to" implement for the training developer. Several new training concepts are presented. They are summarized and portrayed in a unit context in Appendix 1.3. The busy reader may wish to read the Executive Summary and Appendix 1.3 first.

The AAR is the critical training event. Design the Context preparation and the training event itself (Table and Module) to support AAR training.

Individual and small staff team pretraining packages are necessary to advantage the intensive training opportunity.

Several new conceptual approaches and associated development actions should guide implementation of the proposed BCST model:

BCST = TASK MASTERY + EFFECTIVE STAFF TEAMS

Unit performance is grounded in command and staff mastery of the individual and collective tasks prescribed by Battlefield Operating System. *Staff Task Proficiency (STP)* must be developed by individual staff officers, by small staff teams and by the unit staff as a whole. These tasks are trained and evaluated by Observer Controllers. The second component of BCST is *Battle Staff Effectiveness (BSE)*, individual and team mastery of the processes of Organizational Competence and Battle Staff Integration. These skills are trained by the chain of command with support and evaluation provided by OCs trained in Organizational Effectiveness skills (OEs). STP and BSE should be developed initially by TRADOC proponents.

PERFORMANCE-BASED STAFF TRAINING

New Tactical Engagement Simulation (TES) (virtual, constructive and subsistent simulation) permits redesign of Battalion/Brigade echelon command staff training to technical and tactical proficiency. Process complements performance as it must in battle. Design training to immerse command and staff through emerging TES.

AIRLAND BATTLE MANDATES BOTH HORIZONTAL AND VERTICAL STAFF TRAINING

To execute Airland Battle doctrine, BCST must address both horizontal (unit) and vertical (battle functional areas) staff actions from the lowest to the highest echelon of command. Structure both horizontal and vertical BCST.

DISTRIBUTED TRAINING TO STANDARD THROUGH TABLE TRAINING EXERCISES AND TAILORING TRAINING TO COMPETENCE LEVEL DESIRED

Tables, replicable vignettes from Battalion or Brigade "days of battle" in TES and their derivative Modules are established as a uniform training technique which permits BCST to standards established by the doctrinal proponent. Initiate the process by developing the following BCST training packages: Context, Table or Module as appropriate and AAR for:

Table: Battalion TF Deliberate Defense, Execute

Module: S2, S3, FSO small staff team tactical/technical competence

Table: Fire Support: Co/Bn/Bde echelons

Module: S4 Individual tactical/technical competence.

TRAIN BY DIRECT COMPARISON TO PERFORMANCE TO STANDARD

BCST employing TES trains by exposing unit command and staff (horizontal) or Battlefield Operating System (vertical) staff performance to "a way"--highly competent execution of tactical missions--compared in detail to "your way," execution of the same mission to the same METT-T (Table) by the unit or the BOS oriented vertical staff team undergoing BCST training. To validate the model, prepare "a way" Context preparation, Table/Module, AAR of a highly competent unit portrayed in TES and enable documentation of "your way" execution of the same warfighting vignette by the unit, small staff team or individual staff officer in training.

RECOMMENDATIONS

National Guard and DARPA:

1. Approve the model and conceptual direction above for execution as the simulation-based BCST training strategy.
2. Develop a DARPA/NGB action program to evaluate the BCST training strategy.

Department of the Army

Assess the applicability of the BCST training strategy for Total Force institutional training.

1. GENERAL PRINCIPLES

The "cutting edge" of land forces is the Platoon and Company of competent, confident soldiers, well trained to use capable equipment and led by skilled leaders. Frequently, however, success in modern warfare mandates that these small units be supported by increasingly complex supporting battlefield systems. These Battlefield Operating Systems--maneuver; fire support; command and control; intelligence; air defense; mobility, countermobility, survivability; and combat service support--must be skillfully synchronized to enable execution of current doctrine, Airland Battle. Commanders and their staffs, particularly at the Battalion and Brigade level, must be able to focus rapidly decisive combat power in time and space to accomplish the battle intent of the chain of command. This is difficult under any circumstances; doubly so when the enemy is attempting to disrupt the process of synchronization.

Commanders and their staffs need to be effective teams molded to single purpose--success in battle. These teams must be trained as rigorously as any individual soldier or leader for their collective judgment and following actions will permit success by competent, brave platoons. Conversely on the modern battlefield, the best platoons cannot compensate for poor, uncoordinated BOS support misdirected by incompetent staffs. Battle command staff training must be an integral and vital part of any unit training program.

The purpose of this Paper is to propose distributed simulation-based training development policies and programs to cause an order of magnitude improvement in Battle Command Staff Training (BCST) for Army National Guard Brigade and Battalion size units.[1] For the initial concept, see Appendix 1.1, Battle Command/Staff Tables. The approach is to hypothesize training policies and programs for the Army National Guard, which will ensure trained combat unit commanders and staffs for the Guard concurrent

1 The mission statement and general approach are drawn from: Frederic J. Brown, *A Simulation-Based Intensified Training Readiness Strategy for the Reserve Component*, IDA Paper P-2611, December 1991. Enclosure B addresses BCST. See Appendix 1.1. For applications to Total Force contingency operations, joint and with allies, see Frederic J. Brown, "The Training Revolution," *U.S. Army in Transition II: Landpower in the Information Age*, New York: Macmillan-Brassey's, 1993, pp. 99-106.

The Paper does not address explicitly leader training. The focus is getting the Brigade and Battalion staffs performing well. Subsequent work will address leader preparation.

with DARPA development of the technologies necessary for competent execution of the proposed training strategy to standard by average units distributed across the United States. The training strategy is expected to be consistent with Total Force training doctrine (FM 25-100 and 25-101) as well as the Combined Arms Training Strategy (CATS). Appropriate programs will be assessed in Training Effectiveness Analyses.

The key to intensified BSCT employing advanced simulation is immersion in a demanding virtual battlefield which can provide "on the ground" visual confirmation of representative warfighting staff planning and operations challenges created in constructive or virtual simulation. The traditional staff training support--a map sheet with graphics--literally comes alive in vivid visual detail through simulation to demonstrate the effects of good or poor staff planning. The battle staff in training is transported onto the battlefield through distributed virtual or constructive simulation.

The training impact of capturing the interest and imagination of commander and staff through immersion is magnified by the emerging ability to model the warfight to focus the training effects much as one can manipulate electronic images in a VCR today--rewind, fast forward, pause, and tape over are all new training opportunities and challenges. Many have seen the training effect of Instant Replay used to explain complex sports events. These capabilities have yet to be applied to an extraordinarily complex and important problem, the training of battle staffs to focus combat power in time and space to execute the intent of the commander--battle synchronization. They should be particularly effective in addressing and alleviating the challenges of great variation in leader tactical and technical competence because degree of difficulty can be controlled closely. The technology can be shaped to both show "a way" a very competent staff executes complex staff tasks and to permit "your way" of executing the same tasks to identical METT-T for the individual command staff team in training. The essence of training is understanding then correcting any undesirable differences, then moving on to address a broad array of more advanced Total Force command staff training exercises.

So both trainers and trainees face a new range of more detailed training and evaluation possibilities as a byproduct of the nature of virtual distributed simulation--today known as SIMNET. The training "power" of the technology permits capture of every action by every object represented in the simulation. That is, each of the objects acting on the battlefield can be "captured" in space (x, y, and z axes) and time (fractions of a second). To draw again on the sports television analogy, visible instant replay, fast forward or rewind are available from any point on the battlefield at any time. The trainer can move

"the camera" to any position at any time, unobserved to the unit in training by using the stealth capability, to review the ongoing fight from any perspective. Actions can be recreated precisely then "free play" introduced by one or more objects, thus modifying all succeeding events. "What if" exercises are practically unlimited with ability to study (recreate) actions. For example, assume a Battalion is executing a Hasty Attack. The S3-Fire Support Officer elected not to suppress an intermediate objective. Unsuppressed enemy direct fire severely attrited Team Bravo as it attacked. Virtual simulation permits the unit to go back to the LD and "do it again" with the intermediate objective suppressed to observe the difference in battle outcomes with all other factors remaining the same.

These are revolutionary new capabilities. Fortunately, the enabling training development "slate" is not entirely clean. Solid work has been done to improve Guard training; and there has been extensive recent effort to apply distributed simulation to the training of small combat units in the Guard (Bold Shift). In addition there has been recent general conceptual effort directed at improvement of Battle Command Staff training caused by the increasing complexity of the current doctrine, Airland Battle. Combat itself and Combat Training Center experiences reestablish the "truth" that solid staff training requires tactically competent individual staff officers as well as smoothly functioning staff teams such as the S2, S3, and FSO who must think and act almost as one mind in order to synchronize direct and indirect fires. This necessary tactical competence is described as Staff Task Proficiency. However, this proficiency is necessary but it is not sufficient to win.

In addition to Staff Task Proficiency, the individuals, staff teams and the entire battle staff need to be a highly effective, smooth functioning team. More than possessing staff skills, they must also possess Battle Staff Effectiveness composed of Organizational Competence and Battle Staff Integration--as recently proposed and defined drawing on serious research over the past 20 years.[2] Both Staff Task Proficiency and Battle Staff Effectiveness will be discussed in detail in Chapter 2. For now, consider that BCST has two component parts. Successful BCST has to address both with competence.

Several separate but related propositions developed for small unit training are appropriate to BCST. These practical guidelines proposed to govern BCST development are:

2 Joseph Olmstead, *Battle Staff Integration*, IDA Paper P-2560, February 1992.

a. The key to BCST training development is highly effective After Action Reviews (AARs) which train to required individual and staff team competencies. BCST pretrain modules are required to prepare the unit trainers, OCs and OEs to conduct distributed quality BCST to standard. *Design the training to support the AAR such that OCs, OEs, or unit trainers can conduct distributed training to standard.*

The effectiveness of the After Action Review process is well accepted. It involves the participant in analysis of what happened and then coopts him or her to understand and "buy in" to the corrective action. Now distributed virtual and constructive simulation offer the opportunity to immerse the individual commander or staff officer in the challenge, excitement and risk of combined arms battle as they execute their individual or small team staff tasks. This immersion offers promise of significant increase in the effectiveness and efficiency of the BCST training process itself. The technology also can be harnessed to provide quality preparatory training to those who will support the distributed training. Therefore, it is sensible to design the entire BCST training strategy to enable highly effective distributed AARs conducted by mentors (Observer Controllers, Organizational Effectiveness Personnel or unit trainers) all well prepared to train to standard together physically or networked to a common synthetic battlefield. By so doing, a broad menu of quality, exciting BCST to standard has been made available to the separate needs of the units undergoing training. Commanders have a new, highly flexible tool to support their BCST. The key to an order of magnitude increase in the effectiveness and efficiency of BCST is immersion in the pace of modern battle. The Table, developed to show a highly competent unit executing "a way" execution to standard while encouraging "your way" execution in comparison, can be embedded in distributed virtual and constructive simulation.

b. *BCST Tables must be developed* to enable distributed training to prescribed individual and team (staff) competency as defined by performance on MOP/MOE.

Designed to permit repetitive training of explicit command and staff tasks to performance standard, Tables enable common BCST for distributed units. Subsets of Tables which will be called Modules can be designed to train individuals and small staff teams. A series of Tables and Modules of various complexity is necessary for skill diagnosis and skill acquisition.

c. Individualized (self-paced) training programs are required to develop competency in individual command and staff positions and small staff teams by

Battlefield Operating System to ensure effective, efficient BCST. *Individual staff training programs complementary to the Tables and Modules and supportive of the AAR are required.*

Variations in individual and small team competence are inevitable in all units but particularly in the Guard. There are different patterns of individual professional development caused by local circumstances. These combine with normal personnel turbulence and turnover to create unique distributed individual training requirements. BCST should be constructed to support these local requirements for individual and small staff team development as it trains the staff as a whole.

Several tasks must be accomplished to enable these three broad propositions. As the pacing training event, AARs need to be constructed which draw upon agreed BCST Measures of Performance (MOP) and Measures of Effectiveness (MOE).[3] Then generic Tables advocated in b. above need to be developed. Finally from this material, suitable pretraining programs need to be created for individual staff members and key staff teams such as the S2-S3-FSO or SI-S4 so that they are competent and can benefit from the unit staff training. Recall that BCST competency includes not only Staff Task Proficiency but also Battle Staff Effectiveness.

There is one additional complexity. To this point, we have discussed traditional unit staff training--Battalion or Brigade. But this is not enough. To advantage Airland Battle doctrine, BCST should also train vertically by Battlefield Operating System as well as train horizontally by unit echelon (Battalion and Brigade) to mold cohesive staff teams prior to, during, and after BCST. See Figure 1-1 for a graphic representation of the vertical and horizontal training matrix.[4] The horizontal bands represent unit training requirements from Platoon to Echelons Above Corps (EAC). That training includes some content from each of the BOS. The vertical bands represent functional BOS training requirements again from Platoon to EAC. Training in each BOS includes some content from each echelon. BCST occurs at the intersections of vertical and horizontal. Our concern centers at Battalion and Brigade echelons. Note that each BCST node differs from its neighbors--either in echelon or BOS which must be trained. Increasingly, battlefield

3 For this work, Measure of Effectiveness (MOE) is defined as a Measure of Performance (MOP) subsequently evaluated by expert opinion.

4 The focus of this Paper is individual and small group training in the unit although there is limited discussion of institutional training. Most concern is expressed about horizontal BCST--Battalion and Brigade. Therefore, Battalion BCST is the primary focus of this Paper. Vertical BCST by BOS is also important. Much less conceptual work has been done to date on this part of the problem. A methodology for the execution of vertical BCST, Fire Support is proposed at Appendix 1.2.

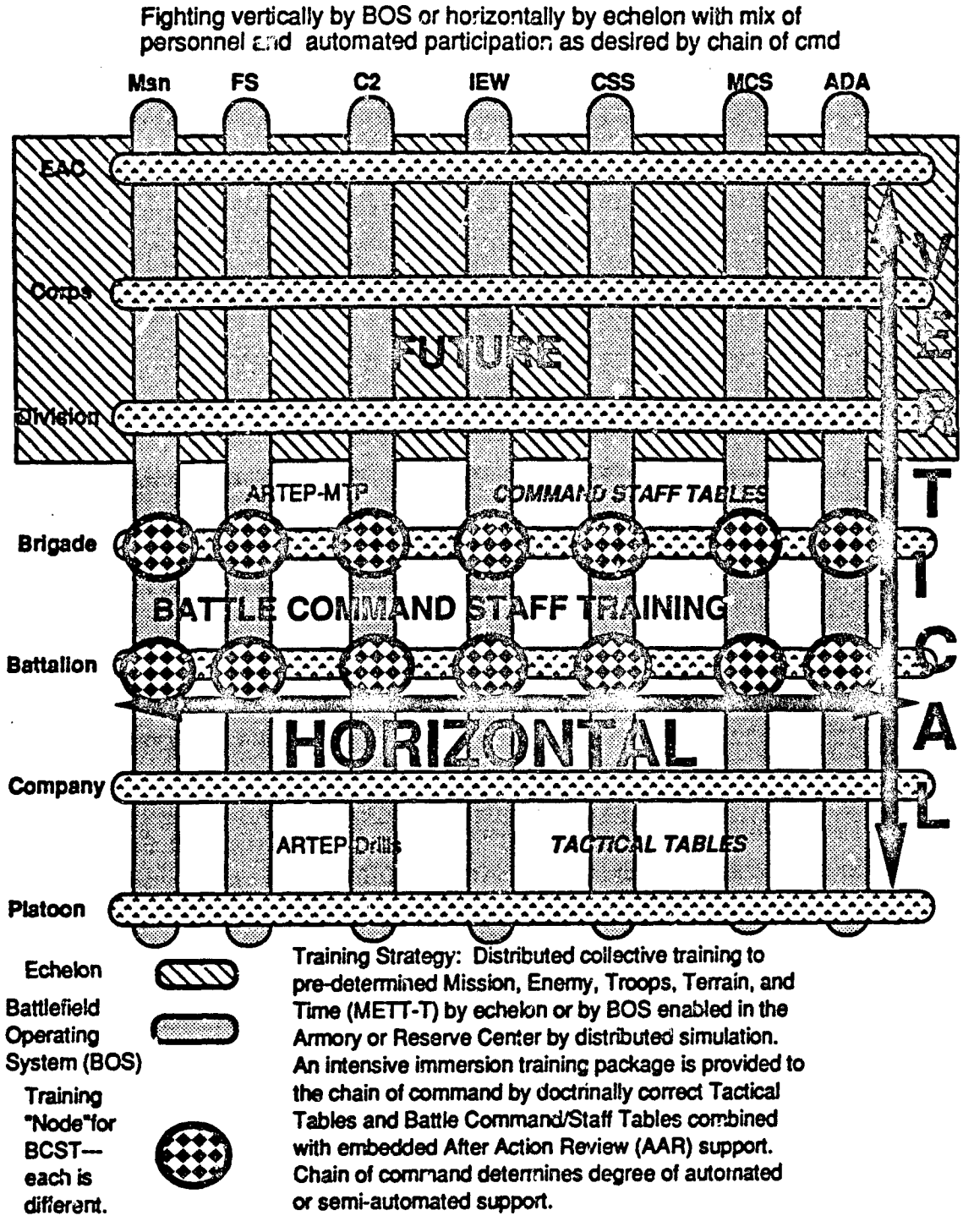


Figure 1-1. National Guard Intensive Training Matrix

effectiveness is a product of both traditional unit competence using assigned resources combined with the combat power achieved by effective vertical orchestration of the combat power of the various Battlefield Operating Systems from the lowest fighting unit to the highest echelon of that BOS. BCST must develop both horizontal and vertical staff task proficiencies. The challenges of vertical BCST are described in greater detail in Appendix 1.2, Vertical BCST-Fire Support General Principles.

This Paper conceptualizes a comprehensive training strategy--then the training development policies and programs which will be necessary to enable the strategy. Subsequent training development will be directed at creating the necessary AAR; writing the Tables; pretraining unit trainers, OCs, or OEs to conduct distributed training to standard; fielding the individual command and staff training packages; and lastly, discussion of potential application of the BCST process to training within the institution. This chapter discusses general principles governing development. Subsequent Chapters treat the AAR, the Tables, unit pretrain, individual and small group command and staff training and applications to institutional training.

THE AFTER ACTION REVIEW

The critical event of the BCST training experience is to create a very effective AAR which will cause the intensified battle command staff training to occur. There are several distinct groups of tasks which should be addressed explicitly in the BCST AAR. They are individual staff officer proficiency in his or her staff responsibilities (the S1 or S4, etc.); the proficiency of small staff groups (S2, S3, FSO) in causing complex actions to occur across BOS (such as merging Intelligence and Fire Support to place timely fires on the enemy); and full staff performance in Battle Staff Proficiency. The second group of tasks are the group teaming skills associated with Battle Staff Integration (Organizational Competence: sensing, communicating information, decision making, stabilizing communicating implementation, coping actions and feedback).[5] Both Observer Controller (OC) and Organizational Effectiveness (OE) expertise is required--OCs to support development of Staff Task Proficiency and OEs to assist in developing Battle Staff Effectiveness.[6]

5 Olmstead, p. V3.

6 Observer Controllers are a widely understood adjunct to unit collective training. They train and evaluate tactical and technical competence. Organizational Effectiveness concerns interpersonnel development to develop effective high performance organizations. It can apply to any organization, civil or military. Here, the context is the use of OE to support the development of organizational competence envisaged by Olmstead in *Battle Staff Integration*. That competence is described here as Battle Staff Effectiveness--an essential complement to Staff Task Proficiency.

Ideally, an AAR would flow entirely from the flow of the battle as it is conducted. The detailed AAR would not be determined until the mission has been fought. Just as there are hundreds of ways to accomplish various Missions to various Enemy, Troops, Terrain and Time Available (METT-T), there are hundreds of AARs. That flexibility is not necessarily desirable or necessary initially when a highly structured BCST Table and AAR are to be conducted for basic level BCST widely distributed across the National Guard. To ensure quality of evaluation to task, condition and standard and to establish uniform standards for the conduct of basic staff training of individual staff officers, small groups, and full battle staffs, a baseline instructional AAR is prepared which is oriented to "a way" recommended for a trained unit to fight the particular ARTEP-MTP mission being fought.

"A way" seems most applicable to units training basic BCST. More experienced contingency-seasoned units probably would neither desire nor tolerate "a way" other than for general train up of new personnel required by staff turbulence or turnover. At this point in improving BCST training readiness, battle success and execution of "what ifs" expand the repertory of solutions and provide experience-derived insights. In time these supplant "a way."

Thus "a way" describes the execution of warfighting by a highly competent unit as captured in virtual or constructive simulation. As a competent unit fights with a given "frozen" starting METT-T (as in any platoon or company level Tactical Table), the omnipresent eye of virtual simulation described above can create an AAR of the execution of that Table. That AAR (the "a way" AAR) is constructed in advance to view and assess the execution of the warfighting in virtual simulation by drawing on MOP and MOE prioritized by the TRADOC Proponent. The "a way" AAR is designed in such manner as to train the unit to the training objectives established by the Proponent. As an important training vehicle, the "a way" AAR itself is designed to cause effective learning to occur.[7] In other words, by observing the "a way" AAR, individual staff officers and staff teams can see "how to."

While design of the "a way" AAR is a focal point for structuring the BCST, the most important AAR for training a particular unit is the AAR discussion of a battle action just fought by the unit which is in training. Call that "your way." How well or poorly did

7 The Proponent plays a critical role in the design of the BCST by ensuring that MOP/MOE associated with important individual and collective tasks validated by CTC or actual combat experience are incorporated in the training. School perceptions may be helpful or not; validated "ground truth" is vital.

the unit do compared to the highly competent unit? MOP by MOP, the unit in training can compare its performance to that of the competent unit as it executed the same Battalion level Table with performance captured in a structured AAR. That comparison by Battlefield Operating System and by staff action--what?, why?, how to improve in the future? etc.--is the heart of the proposed structured BCST training process.

The AAR is the critical training event but the Table is what creates the intensified immersion training environment. The commander and staff have been immersed in an emotionally committing tactical situation or Table. This situation establishes the general Mission, Enemy, Troops, Terrain and Time Available (METT-T) within which the training occurs. Table design comes after the detailed training requirements of the AAR have been aggregated to ensure that the desired staff task training to standard should occur. In other words, know exactly what you want to occur in the AAR, then design the Table or Module to "make it happen."

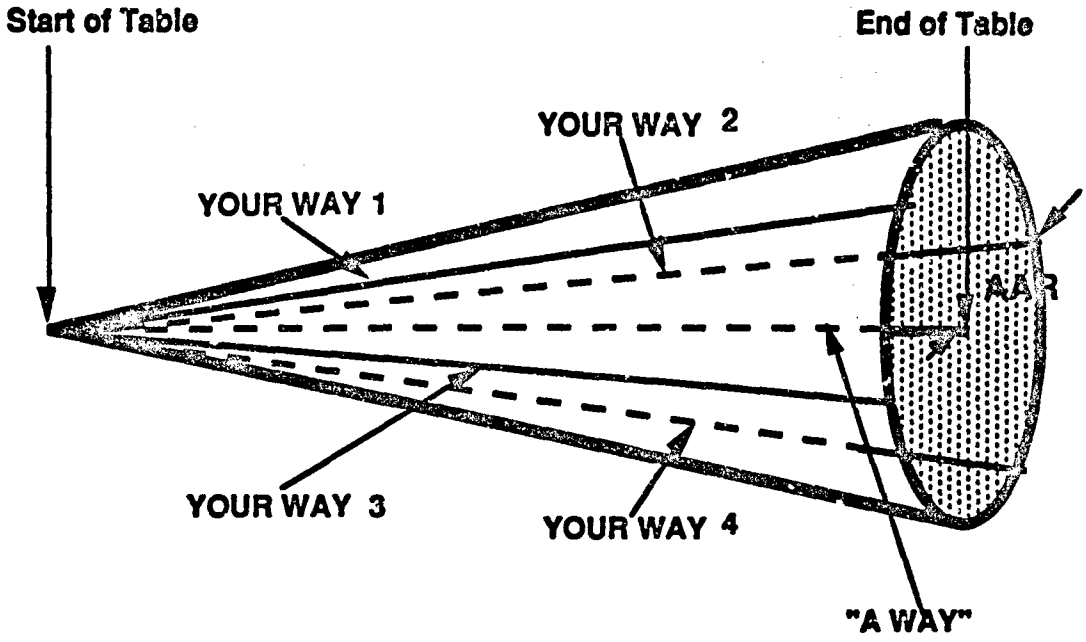
TACTICAL TABLES

The actual "stage setter" for the warfighting is the Table.[8] Eleven general Tables are proposed to focus further development effort. These Tables are divided into four general training scenarios. In the objective system, there would also be a series of Situational Training Exercises (STX) and or Command Post Exercises (CPX) scenarios representing "graduate training opportunities."

Note again that there are two separate but related training activities which are being discussed here. There is "a day of battle" of a competent unit which has been captured in virtual simulation. From this ongoing warfight, periods of time are selected as Tables and the actions of the highly competent unit are captured as "how to do it" or "a way" "snapshots." As discussed above, an "a way" AAR is prepared of the competent unit executing the "snapshot." Then there is the same warfight executed by the unit undergoing BCST training as it addresses the situation portrayed in the "a way" unit with METT-T at initialization exactly as it was for the "a way" Table. Then, there is also an AAR associated with execution of the Table by the unit in training--"your way." That is the critical AAR for unit BCST. The "a way" AAR is important but its value comes as a pattern for conducting the more important AAR by the unit in training. "A way" may not be a "perfect" school solution, but rather a successful "real" solution by a winning unit with whatever minor

[8] For more detailed discussion of Tables, see Enclosure A, Tactical Tables, "A Simulation-Based Intensified Training Readiness Strategy for the Reserve Components," IDA Paper P-2611, December 1991.

imperfections may remain. In other words, competence plus success, not necessarily detailed adherence to "correct" procedures, are what count. "A way" Tables, derivative Modules for individual and small staff team training, and the associated AAR are also the vehicles we intend to use for pretrain, and for remedial training at home or at the local Armory. For a graphic representation of the interactions of "a way," "your way," and the AAR, see Figure 1-2.



Think of the cone above as the representation of a nearly infinite number of ways (combinations of successful "Your Ways") to execute an ARTEP mission given a starting fixed METT-T. Think of "A Way" as one way the mission was executed by a very competent unit, evaluated by MOP, and endorsed by the TRADOC Proponent.

The AAR is: Your Way compared to "A Way" the Mission was executed by a highly competent unit-comparison by Staff Task Proficiency and Battle Staff Effectiveness tasks AND "A Way" examples for Pretrain.

Figure 1-2. AAR: Compare "Your Way" to "A Way"

Tables can take a variety of forms, depending on the purposes of the training. Several scenarios follow which indicate the great breadth of alternatives:

Training Scenario 1: Multiple overlapping unit missions which require simultaneous Planning, Monitoring and Directing. Tables 1 through 4 are 30- or 60-minute "snapshots" of battle which follow a Battalion Task Force for six hours with mission changes from continuing Hasty Attack to Hasty Defense in response to unanticipated enemy resistance. Finally, a Delay is ordered. (Figure 1-3)

Training Scenario 2: Multiple overlapping unit missions of increasing difficulty which require simultaneous Planning, Monitoring and Directing. One situation is presented repetitively with steadily more difficult conditions in 60- then 30-minute "snapshots" of battle to portray a Basic Coordination Table (Table 1 Scenario 1 above), a Staff Action Table (Table 1A) and a Reaction Table (Table 1B). In sum, METT-T is varied to increase the difficulty of the Tables--"crawl, walk, run."

Training Scenario 3: Conduct of a single mission, Battalion Task Force deliberate defense, through Planning, Preparation and Execution. **Table 5** extends for 120 minutes of Planning: Analysis, Integration and Order after receipt of the Commander's initial guidance. **Table 6** requires Preparation, both Readiness and Supervision, including Rehearsals. **Table 7** is Execution: Movement, Maneuver, and Objective commencing after Battle Handoff.

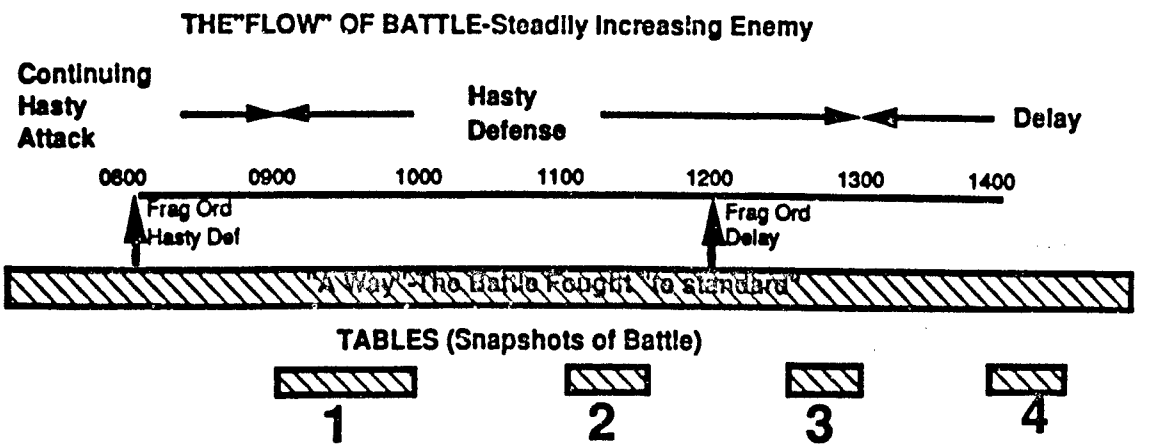
Training Scenario 4: Sequential unit missions (Movement to Contact into Hasty Attack) which require simultaneous Planning, Monitoring and Directing. Table 8 is planning a Hasty Attack with Commander's guidance provided as Movement to Contact continues. Table 9 is direction of the Hasty Attack; Table 10 requires direction of the Hasty Attack while planning for an attack change of mission. Table 11 revisits Table 8 without Commander's Guidance.

The design of the Tables described above is important. Critical will be how they are configured for use during a typical MUTA 3 or 4 devoted to BCST. Various combinations of Table, AAR, Table, AAR are possible. There are as many variations here as the unit commander desires.

UNIT PREPARATION TO CONDUCT THE TRAINING

As these two new capabilities, immersion in a synthetic battlefield and manipulation of time and space in the mind of the trainee, converge, the pacing problem becomes preparing the unit to benefit from this training potential. There is the challenge to prepare

SCENARIO 1: Multiple, overlapping unit missions which require simultaneous Planning, Monitoring, and Directing



Plan and Monitor

TABLE 1 Hasty Attack under way, increasing resistance. FRAGO change of mission to Hasty Defense effective at 1030 received at 0900. Commander's initial guidance provided. **BCST Requirement:** Planning for Hasty Defense while Monitoring continuing Hasty Attack. Table Duration: 60 minutes real time commencing 0900.

Plan

TABLE 2 Improving the Defense. **BCST Requirement:** Planning Defense. Table Duration: 30 minutes real time commencing 1100.

Direct and Plan

TABLE 3 Hasty Defense under way, enemy attack succeeding. FRAGO at 1200 change of mission to Delay on order. Commander's initial guidance provided. **BCST Requirement:** Planning for Delay while Executing Hasty Defense. Table Duration: 30 minutes real time commencing 1230.

Monitor, Plan and Direct

TABLE 4 FRAGO at 1300. Execute Delay effective 1400. **BCST Requirement:** Monitor Defense, Direct Transition from Defense to Delay, Plan Delay. Table Duration: 30 minutes real time commencing 1400.

NOTE: Monitor, Plan, Direct model per ARI Leavenworth (Draft FM 101-5) used. FCX-Fire Support Table could be developed from Table 3, an Intel Table from Table 2 above.

Figure 1-3. Development of BCST Tables

the trainers and associated training support such as OC and OE to advantage the new capabilities that Tables, Modules, and the "a way" AAR provide. Then the chain of command needs to be properly prepared such that improving positive competence, not the despair and frustration of increasing incompetence, is demonstrated as the Tables are executed. All in all, there is a substantial job in preparation for BCST.

Training development should focus in several general areas. The most important task is to "prepare" the unit chain of command--Commanders who understand the capabilities and limitations of the training experience. The unit is motivated; it wants to "fight" and it is confident that it is embarking on a "building experience." In sum, the entire envelope of training program and training support has been crafted to support a positive training experience in the "mind's eye" of the unit in training. Several actions need to be taken to assure this outcome. Orientation training is prepared for the entire chain of command above the unit so support needs are understood and supported. OCs and OEs are available before, during, and after the Table training experience. They are not only tactically and technically competent in areas of expertise but also they are genuinely supportive of unit training. Both OCs and OEs are a "we," not a "they." Finally, the training is absolutely RC-friendly. It has been designed in UTA modules and with appropriate pretrain such that the individual staff officers find it genuinely easy to prepare themselves.

The Army Training System itself supports unit preparation. The purpose of all training and evaluation is to train to standard. There are no secrets, no "one up." If it is helpful to review the Table or Module fought "a way" before the BCST MUTA, do so. The purpose of the training is not to trick or confuse; it is to train--to task, condition, and standard. Individuals, small staff teams and units are expected to "crawl, walk, run." To be sure, victory in Airland Battle requires highly competent units ready to "run." But all start at crawl and proceed at their pace. The training system itself reinforces the rigor of task condition and standard by the logical structure of battlefield doctrine.

Analysis of the operational and training requirements of Airland Battle doctrine has produced a thoughtful structuring of the training requirements. The seven Battlefield Operating Systems establish a framework for the linking of various tasks to specific battlefield performance to task, condition and standard. By virtue of extended observation in combat and the CTC data assembled and analyzed by TRADOC, the Army can identify what has to be done when by whom in BCST. As a result of this rigor, individual and

small team tasks can be disaggregated, trained separately to proficiency "off line" then recombined in carefully designed structured training experiences and missions to ensure collective proficiency to standard. BCST can be divided into its "pieceparts" for distributed training to standard drawing on the great potential of distributed simulation.

In addition, battlefield functions--the seven Battlefield Operating Systems--provide a sensible vertical structure by function such as Fire Support up and down the chain of command. This supplements the normal horizontal structure by echelon--the Battalion, Brigade, etc. The conceptual design of BCST follows this structure, in fact exploits it to create instructive yet interesting, in fact exciting, immersion training situations designed to train to standard.

But BCST does not just happen. It is the result of careful planning as prescribed in FM 25-100. The training plan for BCST should include:

- An assessment of the factors determining the need for BCST. Factors to be considered are such areas as mission readiness, the BCST training background of commander and staff, and turnover of critical personnel in the staff team.
- An inventory of the training "tool bag" available to the unit. What there is (or could be) and how it could be used? What is available in Context material? What about "a way" Tables and Modules? Are there "Tips for the Trainer" prepared for the coming BCST? What does the local OE have as suggested Battle Staff Effectiveness exercises which small staff teams (XO, S1, S4) could use to practice organizational competence skills?
- Development of a deliberate, progressive BCST training plan for the unit. The BCST model of Context, Table or Module and AAR both "a way" and "your way" provides a wide range of training program alternatives suitable for various training environments. With them and the array of distributed training support material available, a detailed "build up" can be prepared extending over several MUTA.

Whatever the training plan selected, the quality and nature of the training support will be vital. It is more than distributed training material--paper,TV, or perhaps CD based. OEs and OCs need to be carefully selected and trained. Senior officers need to understand "immersion" with virtual and constructive simulation. Thoughtful Training Effectiveness Analyses are essential to ensure that the desired training does in fact occur. Lastly, the panoply of support needs to be present to insulate the unit commander and staff from the nits of peacetime administration so they can really focus on BCST. All that and more prepares the unit for BCST training.

SUPPORTING INDIVIDUAL AND SMALL GROUP TRAINING

To this point, BCST has addressed the training of the entire staff team. It has been tacitly assumed that the individual members of the staff have been trained to standard and are competent in execution of their tasks. Recent research by ARI questions this assumption. Assessment of active component battalion staff officers has revealed serious inadequacies in both institutional and unit training.[9] So not only is the current functional competence of individual staff officers and small staff teams essential to the effective operation of battalion staffs in question but also there are credible indications that the present staff officer training system is part of the problem. Therefore, wholly aside from the development of BCST, a concept is required for the preparation and conduct of training necessary to train individuals and staff teams of the Total Force such that they possess at least a minimum level of tactical and technical competence. Consistent with the conceptual framework of BCST, objective competence is defined as that required for the unit as a whole to perform "crawl" level Coordination BCST Tables to standard. Consistent with this objective, training requirements for the development of individual staff officer and small staff team proficiency are defined. They include:

- Development of individual and small staff team proficiency in the tasks defined as Staff Task Proficiency. Most of the tasks are described in current doctrine.
- Training of small staff teams and the entire unit staffs in organizational competence skills--essentially creating high-performance organizations.
- Training by echelon (horizontal) with the initial focus at Battalion and training by Battlefield Operating System (vertical) from the smallest tactical unit such as the Fire Support FIST to the highest tactical echelon the Artillery Brigade at Corps. Effective staff officers must be able to operate effectively both horizontally and vertically.
- Development of individual and small team proficiency at three proficiency levels. They are "crawl, walk, and run." Objective proficiency depends on the readiness priority of the unit and reasonably attainable levels of proficiency as determined by Training Effectiveness Analyses. All individual staff officers and small staff teams of the Total Force should achieve the basic or "crawl" level of competence.

9 For more detailed discussion of ARI research and its implications for institutional training, see Chapter 6.

- Elaborate training support will be required, including OCs and OEs to instruct/mentor the structured training of individuals and teams in distributed units.

There is an explicit training model associated with this training. First and foremost, there must be the explicit, overt support of the chain of command. BCST training diverts key leaders from normal peacetime activities. If the chain of command is not genuinely supportive, intensive command and staff training simply will not happen .

The training model is very similar to that already described for unit BCST. That is, the AAR is the premier training event. After the Context is set for the staff officer or small staff team, they "fight" a Module. The Module is a "cut down" Table tailored to train individual or staff officer tasks to the explicit MOP and MOE already developed in the Table vignette of a "day of battle."

So there are three basic components to the training. Context is established in the mind of the single staff officer or small staff team; the Module is "fought"; finally, the AAR is conducted. Each is complementary to the other. The Context sets the situation and stimulates motivation to excel based on the looming "warfight"; the Module immerses the student in battle and the AAR compares performance "your way"--individual or small team--with that of a highly competent peer--"a way" execution of the Module.

While the model is quite similar to that used for unit training, there are several differences:

- Context is a particularly important part of the training strategy. Not only does it prepare one for immersion "warfighting" in the METT-T of the upcoming Module but also it capitalizes on motivation to do well to train both general staff tasks and tasks associated with performance in the coming Module. In effect, the strategy provides general staff training. Diagnostic evaluation is provided so the Context training can be tailored to specific individual training needs.
- The Modules are derived from Tables but they may include more than one Table from a "day of battle" if that is required to train necessary tasks. For example, an S4 Module should cover 12 to 24 hours so logistic impacts become noticeable.

Training support requirements are elaborate because of the high resolution required due to focus on individual staff actions. MOP and MOE are appropriately explicit. The backup documentation should be as detailed as is the resolution of the MOP and MOE associated with Staff Task Proficiency. Training support includes use of Television, Audio

tapes, photographs, and both Plan View and "Out of window" displays from virtual simulation. Additional requirements are likely as Context training is sought for home and workplace preparation.

Development of individual staff officer and small staff team training should proceed quickly. Methodology is described in Chapter 2. Development of individual staff officer proficiency is generally agreed to be a precondition to successful unit BCST. Clearly, substantial TEA activity will be required.

IMPLICATIONS FOR INSTITUTIONAL TRAINING

The final part of the training equation is the role of the institution. It would seem that the significant increase in effectiveness and efficiency of training enabled by both training and technology development described above should be applicable for institutional training. The training institution is the "schoolhouse"--that part of the support army charged with Initial Entry Training for officers and enlisted soldiers and the centralized professional development of officers and noncommissioned officers. That responsibility is currently vested in TRADOC. The distinguishing characteristic of institutional training is that TRADOC is directly and explicitly responsible for both the content and the quality of the training. By virtue of current technology, that institutional training can be conducted either at the school itself (Leavenworth, Benning, Knox, etc.) or distributed to regional sites and taught by certified agencies such as Army Reserve (USARF) Schools.

Emerging training technologies offer the prospect of considerable expansion in institutional training. Virtual and constructive simulation tied to Tables or Modules can permit unprecedented distribution of training while retaining quality control. As a result, new institutional training opportunities arise. Extending the known quality control of TRADOC permits individuals, small staff teams and units to be trained in three locales: resident instruction as has been the case for years at the traditional "schoolhouse"; non-resident, regional instruction, the regional USARF School; and now non-resident local, institutional instruction at the local Armory. This latter capability is new. It offers the opportunity for profound change in training. Considerable institutional training development would be needed to enable it.

Application of BCST to institutional training should be governed by the following training development guidance:

- All of the training is conducted in a warfighting environment.

- Training support material is designed such that the same package applies for both resident and non-resident regional (USARF) instruction.
- Institutional BCST is drawn from the Tables and Modules prepared for individual, small staff team and unit staff training in the unit.
- Institutional BCST should consist of Tables and Modules reflecting different levels of proficiency.
- The basic design of BCST should support the time constraints of reserve training.
- All institutional training should employ the same training strategy and training support whether conducted in resident, nonresident regional, or nonresident local mode.

Those are six developmental guidelines. They suggest that there is imminent opportunity to change significantly the substance and quality of institutional training for the Total Force. Of equal interest, distributed quality control enabled by the training strategy itself (Context, Tables and AAR) combined with distributed immersion simulation (virtual or constructive) may converge institutional and unit BCST training.

Trained OCs and OEs will be essential to successful implementation of this institutional training strategy, particularly for nonresident local training in the Armory. Their preparation will be exceedingly important. The current division of instructor responsibility between AC and RC will need thoughtful review. The AC may have to assume a greater role as OCs and OEs.

Creating Tables and Modules for institutional training should not present an unacceptable burden. Most of the necessary "crawl" Basic Coordination level training should be enabled by two missions--attack and defend. Unit BCST training support should provide most of the raw material required to construct this institutional training.

Institutional BCST appears both desirable and feasible.

SUMMARY

The ability to replicate complex small unit combat situations with absolute accuracy in placing objects in time and space on a visual virtual battlefield for multiple "reruns" creates the training power of advanced simulation for Battle Command Staff Training. The individual (S3), a small team (S3, S2, FSO), and the entire battle staff all can be immersed in an intense battle situation which unfolds before them in real time; in "Fast Forward" to challenging decision points later in the battle; or after "Rewind," to revisit a poor decision

or incomplete coordination to do it again. The design of the Tables themselves presupposes selection of several critical thirty to sixty minute "snapshots" during an ongoing "day of battle." The end result should be significant improvements in institutional and unit BCST training.

Chapters to follow will describe the BCST training concept in greater detail. It is challenging; technology really provides new options to enable new training concepts which may be difficult to imagine in their aggregate. The following summary of concepts raised in Chapter 1 may be useful to recall central thoughts. They are restated in greater detail in Appendix 1.3. In addition, Appendix 1.3 describes in detail how execution of BCST might occur during a MUTA 4 in a typical Guard tank battalion.[10]

CONCEPTUAL INNOVATIONS IN BCST

- BCST = Staff Task Proficiency + Battle Staff Effectiveness
- TES enables performance, NOT process-basing of staff training
- ALB mandates horizontal and vertical staff training
- Immersion in battle through TES intensifies training
- Tables permit distributed training to standard and tailoring training to competence level required
- Train by direct comparison to performance to standard
- BCST: a total individual and collective training program for institution and unit

Appendix 1.1, Battle Command Staff Tables

Appendix 1.2, Vertical BCST Fire Support General Principles

Appendix 1.3, Conceptual Innovations in Battle Command/Staff Training

10 Recommend a careful reading of Appendix 1.3 to further understand the BCST concept. The following chapters and appendixes expand the detail considerably, but it is tough sledding if you do not understand the new concepts expressed in Chapter 1.

2. THE AAR

The purpose of this chapter is to discuss the AAR and how it should be structured to cause the desired order of magnitude improvement in the effectiveness and efficiency of battle command staff training. The immediate result should be significant improvement in the quality of this training in virtual as well as constructive simulation. Longer term, these changes should be exported to the unit Armory and potentially to the Guardsman's home to cause a major change in both requirements for and capability to execute battle command staff professional development.

The chapter is organized to discuss several aspects of AAR development. The main body of the chapter develops the broad approach. Considerably more detail is then provided at Appendices. First, the conceptual rationale underlying the training development of the AAR. Appendix 2.1 addresses AAR Training Development. The next problem is to tie the AAR process to the rigor of the Systems Approach to Training. That is, to determine the appropriate battle command staff tasks, conditions, and standards as well as the staff interactions to be trained. Appendix 2.2 is Tasks for Battle Command Staff Training. The explicit staff training focus is provided by the Measure of Performance or Measure of Effectiveness associated with the various individual and collective tasks. These are developed in Appendix 2.3, MOP/MOE Development. Much of the effectiveness of the distributed training program will be governed by the quality of the training support--how effectively the training is provided to the Guard recipients. This is discussed in Appendix 2.4, AAR Training Support. Lastly, the "bottom line" of all this is the objective AAR itself. How all proposed above is packaged to be most useful for the diverse needs of the Guard. Appendix 2.5, The Objective AAR, addresses this aspect.

AAR TRAINING DEVELOPMENT

The AAR is the primary vehicle for BCST. It combines excitement and curiosity stimulated by immersion in challenging "warfighting" situations with the rigor of thoughtful detailed evaluation of performance to standard. Consistent with its importance to the training process, thoughtful attention needs to be directed at the design of the AAR. Useful research and subsequent practice has addressed AAR design. Most of this work,

led by TRADOC and ARI has been focused, however, at AARs conducted in the active component environment of CTC or capitalized Major Training Area adjacent to troop concentrations, not the distributed part-time environment of reserve forces. The principles governing the conduct of the AAR remain valid; the challenge is significant variations in application which mandate substantial variations in practice.[1]

Consistent with past training development, the AC-oriented AAR treats command staff training as one element of a comprehensive training exercise targeting individual and collective task performance at platoon, company, and battalion echelons. The TF AAR is described well in ARTEP-71-2 MTP. BCST occurs but it is not the focal point of attention. Staff performance is generally measured by completion of processes rather than explicit measurable performance, yet both are required for effective staff action. Neither specific Measures of Performance nor Measures of Effectiveness are available to provide rigor to Bde/Bn command staff training and evaluation. There is no comprehensive BCST training model which can be related to BCST execution--the AAR--to ensure that the various piece-parts of BCST are trained either during the training exercise (FTX or CFX), preceding or following. These are not necessarily serious gaps in AC BCST; there are numerous other opportunities to develop staff officer or staff team proficiency at home station or in the extensive resident school system. The citizen soldier, however, does not have the time these "fall backs" require. Therefore, the need for new training development appropriate to Guard BCST.

Two particularly important requirements stand out. There needs to be an explicit model of BCST against which specific training programs can be developed. Second, the entire BCST training process needs to be performance-based not only to focus training for the various training audiences but also so that there is a rigorous framework of clearly established tasks, conditions, and standards which permits distribution of training with minimum loss of quality control. There has been thoughtful work on developing a comprehensive model of battle command staff operations over the past twenty years by Joseph Olmstead and numerous others in ARI and elsewhere.[2] While the TRADOC proponents were probing task lists based on doctrine (and were frustrated by their inability to measure anything other than staff process), Olmstead investigated the battle staff as a unified integrated system. He focused on organizational development, the creation of

1 While the focus of this Paper is on reserve applications, there are proposals which seem equally relevant for active forces--such as formulation of an all-purpose BCST Model.

2 Joseph A. Olmstead, *Battle Staff Integration*, IDA Paper P-2560, February 1992.

teams possessing Organizational Competence, and what he described as Battle Staff Integration. Organizational competence consists of quality in sensing, communicating information, decision making, stabilizing, communicating implementation, coping actions, and feedback. Battle staff integration ties these individual and staff team competencies into an integrated functioning battle staff by a series of recommended actions. His model is important and exceedingly useful but alone it will not develop proficiency in executing the tasks required by Airland Battle doctrine.

Developing task proficiency is a challenging problem. The tenets of Airland Battle doctrine call for initiative, agility, synchronization and depth. Achieving these tenets requires much more than individual staff officer proficiency in his or her staff position, important as that is. In addition, synchronization and agility require the development of small staff teams functioning as "one" to rapidly coordinate multi Battlefield Operating System operations such as effective counterfire or suppression of air defense. In counterfire, the S2, S3, and FSO must work as one. In addition, Airland Battle requires the focusing of the various BOS in time and space to achieve the commander's intent. BOS need to be coordinated vertically. The FSOs from the Company FIST to the FSE at DIVARTY must be on the same wavelength if there is to be synchronization. So there are vertical (BOS) teams just as there are horizontal (Bn, Bde, Div) teams. All must be trained in BCST.

The general BCST model should include both vertical and horizontal task proficiency and organizational competence. The BCST model formulated for and used in this Paper consists of Battle Staff Effectiveness and Staff Task Proficiency. Battle Staff Effectiveness includes Organizational Competence and Battle Staff Integration, both as defined by Olmstead. Battle Staff Effectiveness is trained and evaluated by competent Organizational Effectiveness (OE) personnel.[3] Staff Task Proficiency is individual tactical and technical competence; and both vertical and horizontal small team tactical and technical competence. Staff Task Proficiency is trained and evaluated by the chain of command and

3 There is debate as to the necessity of OE personnel separate and distinct from OCs. The objective training support structure should combine these skills *inter alia* to conserve personnel. Yet current responsibilities of both OCs and OEs will require modification to implement BCST. Therefore it seems prudent to adjust each in a test-fix-test mode before combining the two. As suggested by Dandridge M. Malone in reviewing BCST in draft, a middle path may be designation of OCIs (OC for Information Processing) and OCTs (OC for Tactics). Clearly this needs to be assessed in Proofs of Principle.

Observers/Controllers as it is done today at the CTC. **All BCST AARs are structured to enable and reinforce this model.**

The second major training development challenge is to performance-base the BCST training process. This is done by first determining what it is that the most effective and efficient portion of the training process--the AAR--should train. The focus is not just tasks but rather task-related explicit Measures of Performance or Measures of Effectiveness tied to specific battle situations (METT-T). Discussion of these is at the heart of the BCST AAR. The MOP/MOE represent all the elements of Battle Staff Effectiveness and Staff Task Proficiency. Then these specific battle situations (vignettes in "days of battle" or Tables) are created in distributed virtual Tactical Engagement Simulation (TES).[4] The training technique to performance base is "a way" execution of basic BCST in fixed Tables by very competent units compared to "your way" BCST execution by the unit in training fighting the same table. **The primary training technique for Guard BCST AARs is to develop and compare "a way" and "your way" execution of Tables in virtual simulation.** Characteristics of "a way" and "your way" AARs are discussed in greater depth at App. 2.1.

Training development should be able to improve the AAR considerably:

- The AAR could be sequenced to stress multiple simultaneous missions as well as the current CTC sequenced mission model of Plan, Prepare, Execute. This could vary the tempo of operations dependent on various training needs.
- Once the "a way" Tables are developed, their AAR can be extracted for individual or small staff team train up or remedial training in the armory or distributed to work site or home. Specific mini-exercises can be created to address persistent training deficiencies. While the focus is on unit BCST, these should be equally relevant for institutional training drawing on the efficiencies of common knowledge of the METT-T of the Tables. "Your way" Tables offer the opportunity to train by "what ifs." That is, the opportunity to try other courses of action or various combinations of BOS compared to the original "your way." In sum, in "a way," you can make direct comparison to quality "pro" performance of identical tasks. In "your way" you can "try again" employing alternatives. Each technique is conducive to significant increases in the effectiveness and efficiency of training.

4 Subsistent simulation (MILES) and constructive simulation (CBS, BBS) can be effective also. Virtual simulation (SIMNET) seems best for distributed Bn/Bde BCST for reserve forces because it immerses distributed staffs effectively.

- Technology permitting, distributed virtual simulation today will advance as depth of understanding of BCST and the importance and utility of the AAR increases. Better training through better vertical and horizontal AARs seems certain.

Appendix 2.1 extends the discussion of AAR training development. Exploitation of the potential of the BCST AAR has just begun.

TASKS FOR BATTLE COMMAND STAFF TRAINING

There is no unified, accepted BCST task list. Therefore, it has been necessary to develop a new approach both for task development and for the implementing training strategy itself. Basically there were two ways to go.

Alternative A: Review and use or conduct front end analyses of individual and team competencies required including BOS functional (vertical and horizontal) and Battle Staff Effectiveness proficiencies. Select tasks from work done by the training development process in TRADOC supported by individual ARI Field Units, then build the Tables to train these tasks to proficiency.

Alternative B: Use CTC experiences recreated in simulation which permits learning while "warfighting" to build the tasks. "Build" from back (AAR) to front (Table) by ensuring that the appropriate MOE/MOP reflecting important tasks are included in the AAR. Then design the Tables to train to the AAR. Essential task proficiency should "fall out."

Alternative B is recommended. It does not rely on constructing elaborate task lists and it is practical in that it permits steadily improving resolution with successive iterations of BCST in Proofs of Principle. In other words it is supportive of "getting smarter as we go"--a useful learning characteristic when breaking new ground. The steps are to select a working list of tasks to "get in the BCST ballpark," and then define MOP and MOE for the initial BCST iterations. Lastly, design the training support and AAR necessary to bring all together for Proof of Principle trials. Those steps are described in the balance of this Chapter.

There are three general sources for initial Staff Task Proficiency tasks available. They are the tasks included in the ARTEP-71-2 MTP "Mission Training Plan for the Tank and Mechanized Infantry Battalion Task Force"; the Combined Arms Tasks developed by ARI Presidio of Monterey for the Combined Arms Center at Fort Leavenworth and the Army Command and Control Evaluation System (ACCES) developed by ARI Fort

Leavenworth in support of staff training at Leavenworth and in the Battle Command Training Program at Division and Corps echelons.[5]

- ARTEP 71-2 MTP is excellent. Five years old, it may be slightly out of date. There are very specific tasks laid out for key staff members but there is virtually no discussion of collective skills needed by small staff teams or of the requirements of Battle Staff Integration. It is difficult to establish linkages from task to task in mission planning, preparation and execution.
- Most of these deficiencies are corrected in the Combined Arms Battle Tasks prepared by ARI Monterey. There are very useful linking task diagrams and the mission has been subdivided into various phases and segments. This taxonomy, combined with a categorization of tasks by Battlefield Operating Systems, appears exceedingly useful for the Staff Task Proficiency portion of BCST. The ARI product also draws on careful observation of "warfighting" at the Combat Training Centers, particularly the National Training Center. It appears highly promising.
- The third alternative is the ACCES methodology established by ARI Leavenworth. While ACCES provides clearly useful ways to assess battle staff command and control such as an excellent checklist and evaluation methodology for reviewing information flow to and from the Division Staff, ACCES is wholly process-oriented. Division-level processes are not necessarily the same at Battalion. There are few opportunities for the hard MOP sought in training Staff Task Proficiency. On the other hand, there may be very useful MOE for Organizational Competence in training Battle Staff Effectiveness.

Considering the above, the Combined Arms Battle Tasks are most promising as the primary framework for BCST development. Furthermore, the current staff planning model--Plan, Prepare, Execute--should be the model at least for initial development. Later it will clearly be necessary to include an alternative model, perhaps Monitor, Plan, Direct, which may better address multiple simultaneous missions.

To start with the easier horizontal training challenge, I recommend Battalion rather than Brigade echelon for initial development. The choice for vertical BCST is easy. Fire Support is a continuing staff coordination problem; therefore, it is well documented. There is a Fire Support Exercise that could be available as a development model already in

5 Other relevant ARTEP-MTP are those at Brigade and supporting functional units such as Direct Support Artillery and Forward Support Battalions and Engineer, Air Defense Artillery, and Intelligence company size units.

existence in TRADOC. In order to initiate BCST, Battalion TF Defense, Execution is recommended as the horizontal mission. Fire Support is the vertical BOS proposed for detailed development. For elaboration, see App. 1.2.

The next challenge is to ensure that the ingredients of the BCST model are trained. Both Battle Staff Effectiveness and Staff Task Proficiency need to be enabled. Here the virtue of building back from an AAR to a "warfight" Table stands out. As the AAR is constructed, included are staff officer tasks from the Planning segment of the Combined Arms Battle Tasks supplemented by individual tasks from the ARTEP-MTP. An excellent staff position to start with could be either the S4 or the S2. Logistics is challenging horizontally and it immediately goes vertical to accomplish the battle missions (to Brigade-Forward Support Battalion or DISCOM). On the other hand, there are pressing challenges of S2 competency in many Guard units.

Small staff team tasks proceed from the task linkages included in the Combined Arms Battle Tasks. There is little previous training development here. A useful team to select for development is the S2, S3 and FSO. Both the ARTEP-MTP and the Combined Arms Battle Tasks at Battalion echelon provide sufficient detail to define requirements for an AAR and thus start MOP/MOE development. Battle Staff Effectiveness processes have been defined and process assessment worksheets prepared. Development of BSE MOE will be slow but all of the necessary information is there. Here the ACCES work will be helpful.

In sum, there is sufficient task information available to proceed. It will be challenging--test, fix, test--but the development process proposed is suited for this kind of situation. It is designed to build as it goes. The next step is to develop the rigorous MOP and MOE which will drive the AAR. Additional discussion of BCST tasks in included at Appendix 2.2.

MOP/MOE DEVELOPMENT

The "cutting edge" of BCST is the rigor of MOP/MOE. They translate general statements of what needs to be done in battle into very specific practical warfighting examples tied to task, condition and standard. In addition, by virtue of the tactical resolution of TES (virtual or constructive simulation), MOP/MOE can be related to explicit replicable warfights (to "fixed" initial METT-T) which immerse the staff member or staff team in the excitement of an ongoing warfight to intensify and accelerate the BCST training process. In other words, MOP/MOE discussed in AAR are no longer abstract goals or

principles. Rather they are specific examples of how important tasks are performed by a highly competent unit executing the same mission you will face in BCST--"a way." Or they are the practical performance standards against which you and your unit are evaluated as you train to BCST Tables--"your way."

As the enabler of BCST, explicit MOP/MOE must be prepared for each of the training audiences prescribed in the BCST model. Staff Task Proficiency and Battle Staff Effectiveness are expressed to the individual, small team or unit in training as explicit MOP/MOE which are tied to very explicit METT-T in Tables. Available to be observed in "a way" Tables or mini exercises, there can be little doubt precisely what performance is expected of the staff officer, small staff team, or entire battle staff either in doctrinal task performance or in organizational competence.

To demonstrate MOP/MOE development, the S4, the S2, S3, FSO small staff team and Bn TF Defense Execution Phase are selected for detailed layout. Their MOP/MOE are sketched out in Appendix 2.3. They are developed by the following general steps:

1. **Define a general statement of the task, condition and established standard for the individual staff positions or the staff teams to be trained.** Where the current task, condition and standard may not provide sufficient guidance as to Measures of Performance or Measures of Effectiveness, additional Proponent guidance may be required based upon CTC analyses and combat lessons learned.

2. **Describe what must occur in "a way" warfight to cause evaluation data required in 1 above to be developed.** The METT-T of the warfight are adjusted to ensure that the expected MOP/MOE will develop. For example, when the vertical BOS is CSS and/or the S4 or S1, S4, and Battalion Motor Officer are the staff officer or small staff team respectively, the warfight should ensure that logistics are stressed. Start the mission with support well drawn down. The data should be taken from "successful" CTC performance of the same tasks by a good unit.

3. **Fight the "a way" combat action, collect explicit MOP data related to each of the selected tasks.** Fight the "warfight" or Table in simulation with a detailed collection plan to ensure that all MOP/MOE data are captured. Ideally this detailed data would come from actual CTC data rather than a simulation run. Simulation should mimic ground truth. However, the need to develop high resolution data for MOE/MOP purposes may mandate use of simulation data for the immediate future.

4. **Write expanded MOP oriented to the "a way" execution--if MOE, explain nature of the expert interpretation of MOP which is**

required. Literally "fill in the blanks" of the MOP/MOE using the data collected from the "warfight." When completed and packaged for the particular AAR desired for the training audience, this becomes the "a way" AAR.

5. **Translate the specific "a way" MOP to the MOP collection requirements for "your way" execution of the Table.** Knowing what the explicit "a way" MOP/MOE are, ensure that collection means are available to collect, process and disseminate the "your way" MOP/MOE into the "your way" AAR.

That is it. The process described is neither simple nor inexpensive. As we will discuss below in the Objective AAR, there could be a requirement to build tens of training modules. On the other hand, each Battalion "warfight" Table or Module, properly fought and documented in simulation, can provide quality training support material for highly effective and efficient immersion-based distributed individual and collective training to precise standard in either institution or unit. Such a capability could simplify Total Force training enormously.

AAR training support may be the pacing capability to enable this concept.

AAR TRAINING SUPPORT

All that is proposed above is intended to advantage the breakthrough in potential for training which is offered by extensive use of Tactical Engagement Simulation. TES is not only desirable but highly feasible for distributed quality training. Most of the basic training development has been done. The breadboard technologies are here. A very real challenge for distributed application across the National Guard will be the quality, the ease of operation, and the ruggedness of what finally arrives at the average armory to enable the training--the training support. In addition, the training structure (OCs and OEs) and necessary policies and implementing programs must be developed.

Objective AAR training support should:

- Be absolutely responsive to the imagination of the BCST training developer seeking better training techniques, be he or she in TRADOC, at State, or in the unit striving to respond to particular requirements of the chain of command. The technology can manipulate time and space. It possesses the potential to outdo the most imaginative NFL sportscaster in explaining what has happened or should happen. This capability should be decentralized to as low an echelon as possible where talented, innovative Guardsmen will figure out better ways to use the technology. Similarly, the training support should be operable from

fixed armory to cold wet field training location to home or work site of the individual commander or staff officer.

- Be set up to permit the most complex operations to be routinized. For example, the data collection required locally to permit constructing "your way" AARs to compare with "a way" AARs will be formidable. So will causing an execution matrix to "come alive" in four dimensions to demonstrate synchronization requirements--how to or how not to. This is not difficult to routinize if the detailed training support requirement including requirements for OCs and simulation enhancers such as "instant replay" and "magic carpet" is carefully defined well in advance. This definition should accompany the Proof of Principle process.
- Be extraordinarily sensitive to the time constraints on the Guardsman. Develop training support to conserve time. For example, complex as it may be, the AAR should be ready for the staff officer, staff team or unit in training within 15 minutes after completion of the Table exercise.

These may seem to be excessive requirements. Perhaps they are for "your way" AARs, at least initially. But "a way" can be constructed centrally where necessary expertise is available. Expectations of complex yet highly usable and effective training support should be unyielding with respect to "a way." Encouraging progress is being made with the ARI-developed Unit Performance Assessment System (UPAS). An initial PC-based AAR support capability is already in test. Early models could be optimized to permit distributed "a way" AARs. These kinds of initiatives should be encouraged. "Your way" may take longer to actualize. Appendix 2.4 contains additional detail on AAR training support.

The one certainty with respect to immersion-based distributed BCST is that new, as yet unexpected, training opportunities and requirements will arise as individuals and units discover new TES capabilities both constructive and subsistent. For example, why not create a UCOFT-like interactive trainer for individual staff officers with training support drawn from early Battalion echelon Table development? The rigor of MOP/MOE developed for the Table should have many applications. Other "ah ha"s are sure to follow. Guard-oriented training support must lead, not follow. Nowhere is this more evident than in considering the Objective AAR.

THE OBJECTIVE AAR

It should be evident both that the AAR is very important to BCST and that training and simulation technologies offer a broad range of AAR opportunities. What is desired?

What should be the "mark on the wall" for development? There are ample precedents in Combat Training Center experience. A routinized procedure has been institutionalized. It is expressed in the ARTEP-MTP for the appropriate unit. However, the process reflects the training requirements and training environment of the active force. Some adjustments are necessary for the Guard.

Considering the time and focus the AAR deserves and receives, more should be provided than unit collective training. There needs to be solid training across the range of both Staff Task Proficiency and Battle Staff Effectiveness. Individual staff officers and small staff teams should be trained not only in battle tasks but also in organizational competencies.

The AAR should have very flexible composition such that it can be tailored for as many potential users as possible. Units, State Academies, vertical staff teams, all can have uses for miniexercises in simulation. Each needs a different AAR to provide the most effective, efficient distributed training to standard. And as the Tables proliferate, different presentation media will probably be the norm, not the exception. AAR content should not be dependent on virtual simulation alone.

This all suggests that the AAR should be modular in design in order to respond to the many training requirements which can be expected across the Guard. Modules could be required for each primary staff position and small staff team. Each BOS presents a slightly different AAR requirement. Some potential modules are listed in App. 2.5.

It seems evident that the extraordinary power of TES tied to the Systems Approach to Training has created training potential to address many Guard training challenges. Capability is limited only by the intent of the trainer and the design of the particular AAR and Table. "A way" and "your way" tied to distributed virtual simulation are ready for training challenges well beyond BCST.

So what is the Objective AAR? It is a family of AARs tailorable to the diverse needs of Staff Task Proficiency and Battle Staff Effectiveness training. All of the AAR are grounded in several well documented warfights in virtual or constructive simulation and all are structured by the Proponent to support distributed BCST to standard.

3. BCST TABLES

Chapter 3 develops the "engine" for BCST. That is, the Tables and derivative Modules which are the warfighting experiences at the heart of intensive training by immersion in virtual simulation.[1] The Tables must serve two needs. They must produce the behavior cues which will stimulate unit, small staff team, and individual staff officer execution of the desired MOP and MOE. Secondly, they must present a sufficiently realistic warfighting experience on the modern battlefield that they produce the excitement, the challenges, the emotions of total involvement in battle--immersion training. They must be carefully developed and institutionalized so that they are both powerful "fun" staff training and relatively easy to set up for weekend drills.

The chapter discusses several aspects of creating Tables and Modules. Initially the broad requirements are explained. Then additional detail is provided in Appendices. First we develop an array of scenarios for the design of the Tables which vary not only the intensity of the training experience but also the nature of the staff processes required as well as packaging alternatives responsive to various Guard training time availability. Appendix 3.1 is Table Training Scenarios. Having conceptualized the Tables, the next step is to translate concept to practical reality in Proofs of Principle for execution by typical units with appropriate Training Effectiveness Analyses. This is the subject of Appendix 3.2, Tables for the Proof of Principle. One of the greatest challenges in institutionalizing exciting immersion BCST training is quickly transitioning the unit from the peacetime world to the swirl of battle such that they are not overwhelmed by onrushing events. How to effectively, efficiently Set the Context? This is the subject of Appendix 3.3. Then, what needs to be done to "make it happen"? What developments are required in technology or training to do the Proofs of Principle? Who must be trained in what to support the Proofs

1 Tables are intended to complement Situational Training Exercises (STX) in the Army training support inventory. STX require collective task performance to condition and standard in execution of likely warfighting missions. Tables enable STX by requiring performance to task, condition, and standard with explicit Mission, Enemy, Terrain, Troops and Time Available. Tables are particularly useful in enabling distributed training to comparable standard now that Tactical Engagement Simulation permits precise distributed replication of METT-T. For extended discussion of Tables, see Enclosure A, Tactical Tables, to "A Simulation-Based Intensified Training Readiness Strategy for the Reserve Component," IDA Paper P-2611, December 1991.

of Principle and subsequent institutionalization? This is discussed in Appendix 3.4, Table Training Support.

TABLE TRAINING SCENARIOS

In Chapter 2, the process for generating the warfighting MOP and MOE was developed. Essentially, the training development process requires a general statement of the required tasks, conditions and standards; description of what must occur in an "a way" warfight to generate the data; fighting of the action "a way"; translation of the specifics of the action to explicit MOP and MOE--how to do it "a way"; and lastly, translation of "a way" MOP and MOE to data collection for "your way" execution by the staff in training. In Chapter 2, we are concerned with the second step, what must occur? What should be the design of the Table or warfighting experience, the snapshot of a "day of battle"?

The design process centers on producing staff behavior cues. Cues are the dominant and essential product of executing a Table or a derivative Module. The Table is designed to create a series of cues which will stimulate staff action, or inaction, directly and specifically related to prescribed MOP or MOE from the individual staff member, small staff team or entire battle staff. A Table is not just an exciting vignette of battle. It is that; but more important, it is a carefully crafted set of cues to cause training in Staff Task Proficiency and Battle Staff Effectiveness to occur for both horizontal and vertical BCST. The training development challenge is to assemble the proper cues in logical sequence to ensure that the desired training takes place.

It is a challenge, but the developer has considerable flexibility. Doctrine has been translated into detailed task, condition and standard. Battlefield actions are governed by Mission, Enemy, Troops, Terrain, and Time Available--all of which can be varied to produce appropriate cues. It is not a free ride, however. Planning tempos vary by BOS and echelon. TES itself is still developing. Satisfactory limited visibility is yet to come in virtual simulation. But in sum, there is more than enough to start. In Appendix 3.1, thirteen various combinations of Tables are suggested. The "day of battle" in Scenario 1 Tables 1 to 4 (Fig. 3.1-1, App. 3.1) is tough. A deteriorating enemy situation brings multiple overlapping unit missions. The Battalion TF goes from Hasty Attack to Hasty Defense to Delay. The staff must Monitor, Plan and Direct simultaneously. The Tables are 30- to 60-minute "snapshots" of the action during that day. These are difficult "post CTC class" challenges; and ways to intensify the training even more are suggested to demonstrate the power of simulation.

Tables 1-4 portray the training flexibility available to the chain of command. The training developer can manipulate both space (x, y, z axes) and time (t) in fractions of seconds. x, y, z, t can be recreated precisely for all of the objects on the battlefield. Four "snapshots," Tables 1-4, were selected from Scenario 1. The "snapshot"--number, frequency, and duration--can be varied. The simulation can Fast Forward and Rewind. Of course, the unit is "on its own" once the battle begins but the training developer can interject precise and replicable changes in mission, enemy activity, and friendly support as the battle progresses. When the day is over, the developer has the potential to have the complete record of virtually all activity by individual staff officer and small staff team in both battle tasks and organizational processes. To improve the quality of the data, for MOP and MOE use, the same day could be fought several times by the "a way" unit--similar to multiple "takes" in producing a training film.[2]

Scenario 3, Tables 5-7 (Fig. 3.1-2, App. 3.1), addresses a different BCST challenge. These "snapshots" focus on two days of Battalion Task Force Deliberate Defense for units which want to train in the familiar Plan, Prepare, Execute sequence of CTC training. Table 5 is Plan; Table 6 is Prepare; and Table 7 is Execute.[3] Scenario 4, Tables 8-11 (Fig. 3.1-3, App. 3.1), is designed to fall between the preceding sets of Tables in difficulty. They portray Movement to Contact, Hasty Attack over a 6-hour period.

The range of training possibilities permitted by these Tables should be evident. As Time Available is varied, planning can be compressed to the point that staff drills, in fact unit action drills, become essential. Other METT-T factors can be varied with equivalent effects dependent on the training objectives of the proponent who constructs the Tables Remember, however, that the purpose of the Tables is not the explicit warfighting action, challenging as it may be. The purpose is to develop the cues required to develop the MOP and MOE associated with Staff Task Proficiency and Battle Staff Effectiveness. **Creating proper cues is the purpose of the Table.**

The Tables described above address different models of the processes of staff tactical planning. Appendix 1.1, Battle Command/Staff Tables introduced the concept of BSCT with Tables grouped by levels of complexity comparable to the levels proposed for

2 Clearly, the feasibility of multiple iterations will be determined by the nature of the "a way" fight. On the ground at the CTC, one or at most two iterations is about it. In virtual or constructive simulation, several iterations of "a way" are feasible.

3 Table 7 is the horizontal Table proposed for the Proof of Principle.

small unit Tactical Tables. The hierarchy, Basic Coordination Tables, Staff Action Tables, and Command/Staff Reaction Tables, is explained for BCST at Enclosure App. 3.1, Battle Command/Staff Tables. Scenario 2, Tables 1A and 1B (Fig. 3.1-4, App. 3.1), portrays this way of constructing Tables. The basic scenario is similar to Scenario 1--that is, Hasty Attack to Hasty Defense to Delay. Now, however, Table 1 is made more difficult by adding enemy and reducing planning time to make a Staff Action Table (1A) then still more enemy, less time and greater friendly losses to create the Reaction Table (1B).[4]

Thus far, Table modifications have been oriented to the various BCST training outcomes which are possible. Now to review the possibilities for modifying the Tables. That is, the entire training package of Context, Table and AAR adjusting to the diverse scheduling requirements of Guard units. BCST can be scheduled for a UTA 1 (4 hours) or various multiples up to MUTA 5 (20 hours). The design of BCST must be amenable to very flexible scheduling. Enclosure, App. 3.1, Table Execution: Three Alternatives MUTA 2 or 3, portrays various combinations. Clearly, all of the training needs to be packaged modularly, leaving as much flexibility as possible to the local chain of command. Uniformity, training to common standard, comes in "a way" and the explicit MOP and MOE, not in mandated uniform scheduling sequences.

Flexibility should apply not only to the training of the unit staff as a whole but also to the training of the individual staff members and the small staff teams. "A way" execution of any of the thirteen Tables suggested above should be available cut up into "bite size" modules addressing individual and small team as well as full staff training requirements to develop proficiency in staff tasks and organizational processes. These modules were discussed in Appendix 2.5. See Enclosure, App. 2.5, AAR: Application of Modules. They should be available for the unit staff in training.

Units will have unique training situations which need to be addressed if the BCST is to be responsive to the various chains of command. This will not be a problem if all select specific scenarios; then the proponent prepares not only "a way" warfights of the entire Table but also the "bite-size" modules (mini-exercises?) that focus on individual and small team staff task proficiency as well as Battle Staff Effectiveness to the METT-T of the unit horizontal Table. Then the unit chain of command can determine precisely what Table portion of the Scenario they will train on a given MUTA.

[4] The parallel is deliberate to the Reaction Exercises initiated by General Cavazos, CG Forces Command at the NTC in the mid-Eighties. It was a highly effective training experience.

That addresses unit horizontal BCST. Now to the vertical challenge: training by BOS from the lowest tactically significant echelon to the highest. Little work appears to have been done in this area. The conceptual design is quite similar to the horizontal. See App. 1.2, Vertical BCST--Fire Support General Principles. It appears absolutely desirable and feasible to establish Basic Coordination, Staff Action, and Reaction Tables for vertical BOS. See Enclosure, App. 3.1, "Vertical" Tables. Fire Support seems to be the best organized and structured BOS. Therefore Fire Support is selected as the developmental vertical Table. A possible hierarchy of Fire Support Tables is suggested at Enclosure, App. 3.1, Tactical Tables-Fire Support. That is the theory. Now to translate to practice.

TABLES FOR THE PROOF OF PRINCIPLE

Quite an array of potential Tables and Modules has been laid out. How to develop them responsively yet with solid quality control to assure that the desired effects are being achieved? The potential range of Tables and Modules is indicated in Fig. 3.2-1, App. 3.2. These relate to Defense. At a minimum another generic set for Offense seems necessary. After completing those, a staff would probably progress into staff Situational Training Exercises. That will all be subject to Training Effectiveness Analyses.

The issue for now is to get the initial Tables and Modules into Proofs of Principle (POP) of both Tables and the derivative Modules. What are we trying to determine?

POP of Tables should include but not be limited to the following:

- Does the Table cue the MOP and MOE desired?
- Does the "a way" Table achieve desired training objectives?
- Is the training support adequate?
- Do the compression and immersion have the desired effects?

Similar questions arise for the POP of Modules:

- Does horizontal and vertical data collection support the Module?
- Do the "a way" modules train the necessary MOP and MOE?
- Will two sets of Tables (offense, defense) produce sufficient Modules?

Next, what should be the priority for the POPs? The basic training need is for the generic horizontal Table. Therefore Battalion TF Defend, Execution should be first. Given the synchronization challenges present in all organizations, the S2, S3, FSO staff team

training Module should be next. That training development should lead quickly to Fire Support, which should be the second Table to be developed.[5] Lastly, the S4 Module, a tough problem due to the different planning tempo and cycle. The answer may fall out from the initial POP so it is last to advantage preceding BCST work. To sum then, the priorities are:

1. Table: Battalion TF, Defend, Execute.
2. Module: S2, S3, FSO small staff team tactical/technical competence.
3. Table: Fire Support: Co/Bn/Bde echelons.
4. Module: S4 individual tactical/technical competence.

Now to lay out the steps for specific Table development. Only the top priority Table will be discussed here. Variations in methodology for the other three POP are at App. 3.2.

Developing the Table: Battalion TF, Defend, Execute

a. Initial general MOP/MOE are suggested in App. 2.3. Review, collate to develop a general checklist of cues which must be present in the objective Table. For now, don't get into individual staff position MOP and MOE. The focus is overall unit performance.

b. The NTC data base currently maintained at ARI Monterey (Combat Operations Research Facility) has sufficient detail to provide a "first cut" at METT-T and unit designation of a Bn TF that has accomplished BN TF, Deliberate Defense, Execution at the NTC well. Hopefully, this competent performance has occurred within the past year. Cross checking against the MOP/MOE checklist developed above, select a specific operation and associated unit which can be used as the tentative actual model of "a way" execution for development purposes. Analyze mission execution by that actual unit for METT-T usable in the Table to be developed. Select the METT-T for the objective Table. Draw on the expertise and counsel of the chain of command of the "a way" actual unit throughout the remainder of the development. They should be a "red team."

c. Analyze the METT-T for the objective Table from the perspective of feasibility of execution on the NTC data base at the Combined Arms Tactical Training Center at Ft. Knox. What can be represented, what cannot be? If it cannot be,

[5] This sequence should not preclude normal evolution of the Defend Table. It seems highly likely that having developed and assessed the Execution Phase, there will be timely interest in extending use of Scenario 3 to include Planning and Preparation.

is there a manual or prototype technology "work around"? When, at what cost? Returning to the MOP and MOE in a. above, how many of the MOP and MOE can be collected given the current Data Logger, UPAS, etc.? Where are there manual or visual (TV) or audio (net taping) data collection "work-arounds"?

d. Develop a detailed production schedule (time, resources required) to execute the "a way" mission. Think of this as producing a Training Film with total documentation--all orders written and oral, all tactical nets recorded, all staff officers' activities recorded, all AARs recorded. Exhaustive documentation!

e. Produce "a way" Bn TF Defense Execution in virtual simulation at CATTC using the commander and staff of the actual "a way" unit which is being modeled, or another TOE unit or using personnel at Ft. Knox.[6] First iteration should probably be "free flow"--unit and individual execution as they recall at the NTC. Second iteration should be with proponent direction to "fill in the gaps" of MOP and MOE which were not done or not captured in the first iteration. At this stage, SME from USAARMS Command and Staff should probably review "a way" from the perspective of instructing Bn/Bde staff in OAC. What would they want to have included in "a way" if they were to use the product as the primary training support for resident instruction? Capture this documentation on the second iteration. Plan a third iteration for "Murphy."

f. Select one or more Round Out/Round Up Tank or Mechanized Infantry Bns as the developmental "your way" units. Fit the BCST to their unit training situation and FY93/94 training program. Develop their requirements for pre-train and setting the context training support material as well as for Table execution.

g. Repeat the analysis in c. above for SIMNET, Ft. Stewart, Camp McCain, and Mobile SIMNET. The requirement for "your way" execution should be much less complex that that at Knox. Knox had to create the "training film" or "a way" in extraordinary detail to support a number of potential training requirements. "Your way" focuses in on just what is required to meet the BCST requirements of that local chain of command.

h. Battalion A: Develop the training support material required for execution of the Table at CATTC. Train the OCs, OEs, and other training support personnel.

6 This effort is currently under way at Fort Knox under the most competent leadership of MG Paul Funk and Col. Pat O'Neal. A deliberate attack S2, S3, FSO Module is being created from NTC Rotation 88-13. Further, "real time" Table/Module development from CTC training is in development. Data are being collected from December 1992 and January 1993 NTC rotations. For additional comment, see App. 3.2, p.6.

Execute pretrain at the local Armories, "your way" at CATTC. Conduct extensive After Action Reviews of all procedural and substantive aspects of "your way" execution. Apply as appropriate to Battalion B execution, which should occur several months after Battalion A.

Battalion B: Develop the training support material required for execution of the pretrain and Table at distributed Armories using SIMNET-Stewart, McCain, or Mobile SIMNET. Train the OCs, OEs and other training support personnel. Execute pretrain and "your way" at SIMNET-Stewart or McCain or on M SIMNET.

By now, it should be apparent that although BCST in virtual simulation should be quite powerful, there are substantial development challenges. The example draws on virtual simulation to create the initial Tables and Modules. Constructive simulation such as JANUS or BBS should also be considered.[7] Thus far the focus has been on design of the AAR, then creating a Table or Module to make the AAR "happen." Now to the front end of the process. How do we get the staff in training on to this fast-moving train? That is a problem of setting context.

SETTING THE CONTEXT

A significant challenge in implementation of this training concept is placing the battle staff into the situation effectively and efficiently so that each commander and staff officer knows what has preceded the moment when the battle action begins. What was the OPORD and how has it been modified by FRAGO? What was the Commander's intent? What have been the enemy actions? Where are all of the subordinate units? Establishing context requires stage setting for each of the staff members in his or her responsibilities both individually and as a member of a team synchronizing across BOS. The research objective is to set the context in 30 minutes immediately preceding fighting the slice of battle represented by the Table.

There are two major challenges here. They are, in a brief period of time, to bring the unit staff "up to speed" on both the general situation and the specifics necessary for each individual staff officer and small staff team to fit in to a fast moving situation at the MOP or MOE level of detail.

[7] Solid work is being done at the TRADOC research and analysis facility in Monterey with the Navy Postgraduate School to develop JANUS 3D; that is, visual "views" of the digital battlefield on which JANUS fights. This capability, netted by common protocols to the Defense Simulation Internet, has high promise for BCST application.

The general summary should be analogous to the short battle summary used to establish context for the AAR at the NTC. That is, a brief statement of mission, intended plan, then summary of events BOS by BOS from the start of mission execution, "the day of battle," until the instant of initialization of the Table. The precise update by staff position will be the more difficult of the two--but with the highest potential for additional training applications to amortize the considerable effort. The challenge is to compress into 15 to 20 minutes a thumbnail sketch of the actions and orders of that staff officer or staff team from the start of the planning phase to the instant of initialization of the Table. In all cases, we are describing "a way" execution--basically drawing on the excellence of the individual staff officers and small staff teams of the "a way" unit to orient their "alter egos" in the "your way" unit as they prepare to "fight" the Table.

The following capabilities should be available to set the context for execution of a Table at Battalion echelon. These are suggestions for data collection from "a way" execution as the Table is being prepared. They are discussed in greater detail in App. 3.3.

- All appropriate written orders and maps with appropriate overlays. They should be complete for "a way" execution; to the instant of initialization for "your way."
- All substantive communications on tactical nets.
- The flow of the various BOS prior to initiation of the Table.
- Television coverage of important interpersonal communications.
- Four dimensional (x, y, z, t) representation of the various planning and execution matrices for the "a way" unit.

This last training support introduces the range of innovative new material which is enabled by TES (virtual simulation). There are practically unlimited combinations of new training support capabilities available. The Plan View Display permits a "zoom" bird's eye view of the battlefield. Stealth allows "out of window" views of the digitized battlefield from any perspective at any time. Data Logger can collect the highly detailed x, y, z, t data. The technical challenge is to create such 4D training support capability. Then, the training developer has to structure it to set the context in thirty minutes. Technology may permit similar resolution from TES (constructive simulation).

That was for the horizontal training. Conceptually, establishment of vertical context should be done in the same manner. Immerse the vertical staff team in the flow of the BOS throughout the "day of battle." The challenge is to recreate in 4D the interactions within the

BOS to the instant of initiation of the Table. For example, if the Table is Fire Support and the training audience is at Brigade, Battalion, and Company, the training requirement is to make the Fire Support Plans at each echelon "live" interactively in virtual reality. This should not only support setting context; it will also provide new opportunities for training synchronization. There may be exciting new opportunities for BCST--both in training and, more critically, in an operational context. What is required to do all this?

TABLE TRAINING SUPPORT

That brings us to the challenges of timely implementation of the various concepts at least in POP. Training support is the totality of what is required to enable BCST employing immersion in virtual simulation and distributed with quality control for Guard training. There is considerable effort required to initiate BCST as envisaged in this Paper although clearly there will be "workarounds" possible to support early POPs.

There are technical problems to be resolved both in the development of distributed virtual simulation and in training development. For more detailed discussion, see Appendix 3.4. First, there are several important requirements for simulation technology development. Effective BCST requires:

- High resolution digitized terrain suitable for both CATTC and distributed Guard applications.
- Effective automated and semiautomated force representation for M SIMNET.
- Some representation of selected BOS characteristics such as air defense, NBC, mines and GSRs currently missing in CATTC.
- Effective distribution of virtual simulation to and between distributed unit armories.
- Sufficient data acquisition and manipulation capability to capture then prepare and present the various MOP and MOE to the training audiences.

These considerable challenges are matched on the training development side with equally demanding challenges:

- "A way" execution has to be captured in sufficient detail to enable both Tables and derivative Modules.
- Training packages have to be developed for context orientation for both "a way" review and for the more critical "your way" execution.
- The "your way" AAR has to be prepared "real time" to present the appropriate MOP and MOE to the staff in training in a timely manner.

- Orientation programs are required to ensure the Guard chain of command understands both concept and execution.
- All of the personnel required for direct support of the training must be trained. Trained OCs should not be a problem. The training has been institutionalized for the Combat Training Centers. The preparation of tactically competent OEs, however, will be difficult. Old courses and trainers will have to be reconstituted.
- The last explicitly training developmental challenge is institutionalization of the process of Training Effectiveness Analyses. ARI seems well suited to overwatch this part of development.

Even if all above has been done well, the training will be unsuccessful if there is not positive credible local training support. The unit TOC should be configured as it is in the field. Commanders should have the same views of the battlefield that they would have in actual combat. The context should be set and then the AAR conducted in the most positive training environment possible. There are no dogmatic solutions. The "bottom line is that the staff should be situated as the chain of command, and OCs, OEs believe best for productive training.

The Tables and Modules should be challenging to create but the rewards of distributed immersion BCST to standard are enormous. The return seems far greater than the challenge.

4. UNIT PREPARATION TO CONDUCT THE TABLE TRAINING

COMMAND PRETRAIN

The purpose of this chapter is to propose a training strategy which will prepare the unit to execute the BCST Tables and Modules to standard. The training strategy is designed for unit use in the Armory or for training as it may be distributed to home or work site for individual training under the direction of the unit. The discussion which follows is focused on horizontal Tables--the most pressing problem of BCST. However, most elements of the package should apply also to vertical BCST. That aspect will be discussed at the end of the chapter.

The subject of this chapter is unit collective BCST. It considers individual and staff team training in the unit only incidentally (Chapter 5) and individual or collective preparation of the individual, small team or potentially the unit in the institutional training environment (Chapter 6). The focus of this chapter is narrowed to preparation for conduct of collective BCST in the unit with the specific objective of successful unit completion of the Tables as a surrogate of actual execution of Airland Battle doctrine. The mission is to describe unit preparation which should be undertaken to support the unit in satisfactory execution of the BCST MOP and MOE embedded in the various BCST Tables.

A major challenge in accomplishing this mission is defining, then enabling the totality of training support which needs to be provided to ensure the Guard unit gains the maximum training benefit from conduct of the Table during the MUTA. For success, that is, execution to standard of the BCST Table, the unit must be "prepared." That is:

- The unit has been oriented to understand the capabilities and limitations of the Tables and accepts Table training as a positive, building experience;
- The unit is a motivated unit that wants to "fight"--a unit prepared such that it is ready to fight at the moment of initiation. The unit is not just passively "up to speed" for transfer of responsibility of tactical command but rather it is willing and capable of fighting aggressively "to win";

- The unit is supported by highly competent training support so there is no "wasted motion" in the unit. Competing administrative support and process diversions are reduced if not eliminated when the unit focus is to be on warfighting. Unit personnel can--and know they are expected to--focus entirely on the substance of warfighting as an integrated team.[1]

It should be evident from above that a positive training environment is an important contributor to success in such a compressed training program. The training is extraordinarily intense. The training benefit multiplies as the unit becomes more involved, more committed to battle outcomes--"CTC-style." The indifferent unit will get poor training despite the capabilities of the technology. So a particular aspect of preparation is "setting the mindset" of the unit. Most of the challenge of motivation is and must remain the responsibility of the chain of command. But skillful design of the training support can make that unit commander's task much easier.

To assist the commander in motivating his or her unit, training design should address the following ingredients of success:

- *The chain of command (AC/RC) understands and supports.* This is not solely the chain of command of the unit in training. It includes senior headquarters both in the Capstone "go to war" command trace and in the State chain of command. Each higher headquarters needs to be briefed on the purposes and procedures for implementation of the training, particularly in the early phases when use of virtual and distributed simulation is still novel to the Total Army.
- *Presence of trained, competent, motivated OC/OE personnel.* Observer Controllers set an important tone. Cold, aloof, critical, antagonistic OCs can negate the most promising training environment. The OCs are the mentors--the experts who can encourage very positive learning by their expertise and attitude. They embed the explicit MOP and MOE of Staff Task Proficiency in the training. The OCs are supported and complemented by OEs who should be credible in assessing organizational competencies. Not only competent, OEs must be trusted to be counsellors of the unit as it strives to become a battle team rather than seen as the "informers" of the chain of command. This and more is well known.[2] It has been partially institutionalized in the Army during the past two decades. The expertise of OC and OE technical support needs to be

1 This is much easier said than done given the difficulties in focusing on demanding unit training--particularly BCST in peacetime. The key is the focus and priorities of the commander. For that reason alone, the commander must be an active participant in the tactical warfighting training process whether conducting the training or being trained himself or herself.

2 The OC and OE can be the same individual in theory. In practice, it is difficult to do both well because there are often competing simultaneous data collection or observation requirements in the heat of battle.

translated to BCST Tables as an important part of preparation for unit performance. That is, they should be as active participants in the "spin up" for BCST as they are in execution and in the post event remediation training.

- *The BCST physical plant is optimized for the Guard training environment.* This may seem self-evident. It is not. All of the IDT training support has to be designed for the 4-hour UTA if it is to be usable on a sustained basis. The training has to be amenable to distributed execution. For any training support to be actually available for "hip pocket" or opportunity training in the RC, that training support has to be distributed at least to the battalion Armory on a continuing basis.[3] The cost of the training support should be sufficiently low that it can be distributed widely. When the S2 or the S4 has the time to train to individual task proficiency--reimbursed or not--the training support needs to be readily available. If it is not, the benefits of stimulating professional curiosity and motivation to become more proficient through immersion training will be lost.

- *There is basic unit proficiency that can be drawn upon in challenging tactical situations--Tables.* There are two aspects of proficiency here. One is basic staff task proficiency. Warned or alerted by the experience of others, the unit is motivated to become sufficiently competent through individual and small staff team preparation that the Table itself is anticipated, not dreaded, as a training experience. The unit anticipates no surprises, rather it expects and experiences a solid supportive collective training environment where proficiency in basic staff actions will suffice at least to prevent unit embarrassment. That is, the unit staff knows it must demonstrate a basic or "crawl" level of proficiency training on Basic Coordination exercises to develop its competence and confidence.[4]

 The second aspect of proficiency is basic organizational competence. People know each other. There is the mutual trust created in a team which is used to

3 It may need to go lower to ensure appropriate "slice" training. Combat Engineers and Air Defense Artillery can provide Platoons to support the maneuver battalion TF. These Platoons would need appropriate distributed training support so their leaders can participate in the Battalion TF BCST. A similar range of simulation support would be necessary to support vertical BCST. For example, vertical Fire Support training would require participation from selected Company FISTs all the way up to Division Artillery--all distributed at multiple sites.

4 There is a sensitive issue here. Basic BCST task proficiency is desired, therefore it should be demonstrated as part of the training process. Yet simulation should permit the use of adaptive training, starting perhaps at a "walk" or even "run" level as determined by actual unit performance. Thus the unit is permitted to develop its own "prescription" for training based on its own performance--not dictated from afar. This is highly desirable but only AFTER the unit has demonstrated that it--individual staff officers, small staff teams and entire unit staff--can perform the "basics" to standard. That basic proficiency must be demonstrated first or there is no consistent baseline BCST across the Total Force.

working together. This is an important psychological point--Chapter 5 addresses the creation of this confidence through individual and small team training which has to start at the top with unit commander/XO who have been assisted/trained/supported (if necessary one-on-one) to become credibly proficient in at least the Basic Coordination Table.

This returns us to preparing the commander for his or her role in BCST. As discussed above, commander participation is essential if the genuine focus is to be on warfighting despite the normal competing demands of peacetime administration. Some demonstration of personal proficiency is expected of the commander--some "leading by example." Yet the commander is also in training. As a citizen-soldier, he has had little more detailed pretraining for his position than the subordinate. The OC and OE alleviate this dilemma both by training of the commander/XO suggested above and by proactively training subordinate individual staff officers and small staff teams.[5] There cannot be a lot of pressure on the unit as understanding of this process matures in the organization or everybody will "go to ground."

This last facet of preparation is particularly important. There is no suggestion whatsoever that any task be made less challenging or that any "snapshot" of battle be less unrealistic. The point is that the nature of BCST envisaged here is sufficiently powerful and novel that unit introduction needs to be thought through very carefully at every level including command. It is not the time for "sink or swim." Leave that for the tough "run" exercises after the unit staff has demonstrated basic proficiency then "crawled and walked" in adaptive training exercises to their satisfaction, and pride.[6]

"Preparation" of the unit includes the creation of a positive BCST training environment. With virtual simulation this is less difficult than it might seem. The training system itself contributes in an important way. The Systems Approach to Training is focused on performance-oriented training to task, condition, and standard. Training is not normative-based (graded on the curve), rather it is competency-based to standard. All training is evaluation and all internal or external evaluation to standard is training. The end

5 This is a notable and necessary departure from AC practice mandated by persistent inadequacies in RC professional development continually handicapped by insufficient time. Today, most individual position professional preparation occurs in the unit. See Chapter 6, particularly the ARI-Benning report on JRTC training.

6 More likely, individual staff officers and small staff teams will be at various levels of proficiency due to personnel turbulence and turnover. Competent observers, appropriate measures, and timely data capture should permit unit selection of exercises of appropriate difficulty. This is not a lockstep "crawl, walk, run" training experience.

result of BCST is ability of the commander and staff to perform prescribed combined arms tasks to standard.[7] Therefore there are no "secrets" associated with mastering BCST. There is no risk if the commander or staff know in advance what is required (performance to standard on the tasks of the BCST Table) and "train for the evaluation." In fact, that is precisely what we want them to do to develop task competency. Particularly given the severe time constraints of RC training, any self-generated additional "off line" training which can improve individual or small group proficiency and then unit competence in BCST performance is highly desirable.

The training development premise is that the BCST training process can be structured so that staff members will become personally and collectively stimulated to master the challenge particularly if the training is designed such that it can be conducted in both individual and group mode in work site or from home. The training must be genuinely interesting, in fact exciting, and it must be convenient despite significant normal physical separation of the commander and his or her staff. And it must phased in so that individuals have the opportunity to demonstrate competence and pride, not incompetence and rejection. Again, there should be "no secrets," at least initially--an injunction reinforced by the Systems Approach to Training.

That raises the second beneficial aspect of the Army training system. Analysis of the operational and training requirements of Airland Battle doctrine has produced a thoughtful structuring of the training requirements. The seven Battlefield Operating Systems establish a framework for the linking of various tasks to specific battlefield performance to task, condition and standard. By virtue of extended observation in combat and at the CTC assembled and analyzed by ARI-Presidio of Monterey for TRADOC, the Army knows what has to be done when by whom in BCST. As a result of this rigor, individual and small team tasks can be disaggregated, trained separately to proficiency "off line" then recombined and synchronized in carefully designed structured positive training experiences to ensure collective proficiency to standard. BCST can be divided into its "pieceparts" or MOP and MOE for distributed training to standard drawing on the great potential of distributed simulation. The system is absolutely "malleable" to the sensitive issues of unit acceptance suggested above without loss of training rigor. Again it is a challenge of design of the training program for unit preparation. What to do to get started?

[7] An associated benefit is the competency-basing of the unit. As proficiency is clearly defined, trained, and fairly evaluated, performance can be rewarded and non performance discouraged.

PREPARATION OF THE TRAINING PLAN

First, make an estimate of the training situation for BCST. Then, following the precepts of FM 25-100, develop the various long-term, short-term, and near-term training plans integral to responsible training planning and resource allocation. The following have to be done. Each will be discussed in turn:

a. Assess the factors determining the need for BCST-mission readiness, background of commander and staff, personnel turbulence.

b. Inventory the training "tool bag" available to the unit. What there is (or could be) and how it could be used?

c. Develop a deliberate training plan for BCST.

a. Assess the Factors Determining the Need for BCST--Mission Readiness, Background of Commander and Staff, Personnel Turbulence

At present there are few explicit time-phased requirements for BCST. Exercises are prescribed with an expected frequency in the Combined Arms Training Strategy but specific requirements are fuzzy. Execution of a particular exercise such as a Command Post Exercise or a Command Field Exercise at a prescribed frequency and pace is all that is required. There is no discussion of mission orientation or staff tasks which need to be trained to any defined measure of proficiency.

BCST permits a significant improvement in this resolution. Now, thanks to the work at ARI, BCST performance can be related to Planning, Preparation, or Execution of ARTEP-MTP missions with explicit MOP and MOE enabled by TES (virtual and constructive simulation). This rigor permits much more explicit analysis of the need for some form of BCST.[8] The kinds of questions which need to be asked to assess the BCST training requirement include:

- What level of staff proficiency should be maintained? How many days of BCST should be available post mobilization before the unit could deploy on a contingency mission? What are likely missions? What joint capability will accompany; what is likely sharing of BOS responsibilities with allies? Are there particular joint or combined SOPs which need to be trained?

[8] Other useful work has been done at the Combined Arms Command in developing other staff action models and by ARI-Leavenworth in preparing an evaluation methodology for BCST (ACCES). See App. 2.2.

- What has been the turnover of key staff members individually and as members of small staff teams? Turnover raises substantial horizontal or vertical staff retraining responsibilities. When the S3 is replaced, what S2, S3, FSO small staff team training in which Modules needs to be scheduled to ensure that direct and indirect fire coordination capability is maintained in the unit staff? When the S4 is replaced, what vertical CSS training should the replacement have? The impact of vertical turnover is much more complex and is virtually unknown to date. Intuitively, personnel change up the BOS is important. Change of the DS Artillery Battalion Commander or S3 can cause significant change in the nature of fire support available to the FIST supporting a Tank Company. Who needs to do what, when, to resynchronize the command and staff exercise of fire support?
- What has been the training of the individual staff members? If the S2 has only been to the Officer Basic Course (Infantry), what individual S2 Modules should he train to proficiency before he is a competent staff S2? Diagnostic pretesting of staff officers' competency is discussed in Chapter 5.

These are just several of the kinds of questions which need to be asked as a unit makes BCST training estimates. Proponents can and should define these in much greater detail. But however defined, the end result of the BCST estimate should be an assessment of BCST training requirements for both horizontal and vertical training of unit staffs, individual staff members and small staff teams. As BCST gets under way, assessment "ground rules" will be sparse. Diagnostic testing of individual and small staff team proficiency seems essential until a better experiential data base is developed.[9]

b. Inventory the Training "Tool Bag" Available to the Unit. What There Is (or Could Be) and How it Could Be Used?

The challenge of unit preparation for BCST is thoughtful presentation of the "pieceparts" of complex operations in a manner which stimulates excited, imaginative self-study by the commander and staff. The "toolkit" to accomplish this should be elaborate, designed to stimulate both personal interest and effective learning.[10] It should consist of

9 Diagnostic testing should not be limited to early BCST. Future individual and small staff team refresher BCST training requirements should be based on frequent diagnostic evaluation. Those who validate personal proficiency would not have to participate in individual staff officer or small staff team Module training. Those below standard would have to revalidate their proficiency by Module training.

10 While the focus of this training support material is on BCST in the operational unit, the material should be equally applicable for institutional BCST. The Tables could become updated TRADOC Common Teaching Scenarios for application in intensive warfighting training packages for the RC in both distributed institutional and unit training. Institutional training is discussed in Chapter 6.

but not be limited to the following (for extended discussion of the "toolkit" possibilities, see Appendix 3.3, Setting the Context):

- Explanation of the Measures of Performance and Measures of Effectiveness employed to evaluate BCST performance. Natural curiosity stimulates interest in how one is to be evaluated. The competitive instinct reinforces curiosity. MOP, and particularly MOE since they reflect the judgments of "experts," reflect the wisdom of seasoned experience. As officers observe execution of Tables or Modules, questions come to mind in even the most unimaginative. Why is MOE X important? How to improve performance in MOP Y? Reasons why MOE Y is difficult to achieve? Then, how to solve the training problem--common errors in MOP Y observed at CTC or TCDC and how to solve them? This material could be paper, TV-based or in time, virtual or constructive simulation-based.[11]

- Copy of the Context material as well as the AAR of the "a way" execution of the Tables to be trained at the BCST MUTA. This could be annotated with suggestions of what Tactics, Techniques, or Procedures could usefully be discussed before starting the Table in the form of a suggested Discussion Guide. Training support could be provided on TV cassette initially, eventually it should be available on a home "porthole" to the virtual or constructive battlefield.

- PVD and/or Stealth tour of the Table battlefield both overall (such as a several minute summary of the "a way" Table) and a summary of significant actions by Battlefield Operating System including 4D representation of important planning or execution matrices. For the BOS overview, a combination of Stealth, PVD and statistical displays of MOP/MOE could be drawn from the "a way" Table. The initial training support could be TV cassette.

- "Tips for the Trainer"--Development of "a way" to conduct the Table training in one or more UTAs. Suggestions could be included of various combinations of time use in Context, Table, and AAR based on OC and OE support that may be available. These tips should also address likely situations involving personnel turnover or turbulence such as a new Battalion XO or S3. Paper or TV-based training support would be appropriate.

- Recommended modifications of METT-T for subsequent iterations of the Table. These should include both a detailed description of the specific change

11 Paper and TV cassettes are readily available and low cost. In time, much of the proposed training support should become interactive CD ROM-based and later be netted directly to the virtual or constructive battlefield to better export immersion to the home "table top" at costs comparable to TV Cable and VCR today. There would seem to be a need for an interactive electronic bulletin to encourage tactical discussion--a "Combat Prodigy" as suggested by Mike Malone.

and how the change is likely to influence both the battle outcome and expected training in the various BOS and staff positions. The precision of the simulation permits variations in METT-T to stress or unstress both staff position and BOS depending on additional training objectives of the chain of command. This training support should be paper-based initially to encourage wide distribution.

- Discussion Guides for chain of command use in developing a cohesive battle staff team. Drawing on the requirements for effective Battle Staff Effectiveness, specific examples would be provided of good and poor organizational competence. The examples would be drawn from "a way" execution of the Table for review prior to "your way" execution and from the AAR for subsequent use. If OE-competent observers are available during the execution of the Table, they could prepare the training support for post Table Battle Staff Effectiveness training.[12]

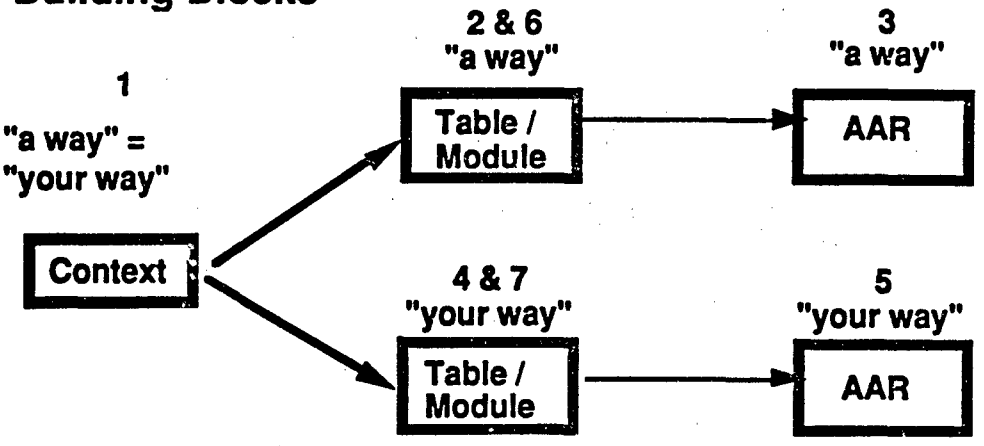
c. Develop a Deliberate Training Plan for BCST

After the Training Estimate has been completed and the training support "tool kit" assessed, the next step is to develop the BCST training program for the particular unit. The BCST model proposed presents a wide range of training alternatives. At Figure 4-1 are several. There are at least seven basic building blocks. They are: Context (identical for "a way" and "your way"; the Table or Module (four alternatives: "a way" and "your way" each executed either on the ground in subsistent TES [MILES] or in virtual or constructive TES [SIMNET or JANUS]); and the AAR (one for "a way" and one for "your way"). Those seven parts can be combined in any group of three or more. Examples follow:

- "Your way" Context, then "your way" Table in constructive simulation, then "your way" AAR, then "a way" AAR. This permits the unit in training to complete the Table in JANUS then compare the results to those of the "a way" unit.
- "A way" Context, then "a way" Module (S2, S3, FSO) in virtual simulation, then "a way" AAR. This is the "information age" training film on how to execute staff tasks as a member of the S2, S3, FSO small staff team.
- "Your way" Context, then "your way" Table in virtual simulation, then "your way" AAR. The unit trains a BCST Table on SIMNET.

12 These examples represent objective capability. The range of training support will improve as Training Effectiveness Analyses are conducted and leaders reflect on the most useful range of training support.

Seven "Building Blocks"



2 & 4 virtual or constructive TES
6 & 7 subsistent TES

Alternative training "packages"as sequence of "Building Blocks" varies

Combinations to "fit" different training requirements

1&4&5&3- training unit Table execution comparing "your way" to "a way"

1&2&3- the information age "training film" for training unit mission, BOS and staff sync

1&4&5- training unit Table execution

2&3&1&4&5- training unit trains to "a way," then executes Table "your way"

1&4&5&7&5- training unit trains in virtual simulation (SIMNET) to prepare for subsistent (MILES)

... or some other better combination developed from unit experiences, or by OCs and OEs.

Figure 4-1. Training Alternatives

- "A way" Table, then "a way" AAR, then "your way" Context, then "your way" in constructive simulation, then "your way" AAR. The unit trains by observing "a way" in detail, then executes "your way" in JANUS.
- "Your way" Context, then "your way" in virtual simulation, then "your way" AAR, then "your way" on the terrain, then "your way" AAR. This sequence permits the unit to train in virtual simulation in SIMNET then conduct the same Table on the ground using MILES.

The range of alternatives is quite substantial, as it should be, given the great variety in training environments across the Guard. I will propose "one way" to integrate the objective horizontal BCST program--the development Table of Battalion TF Defend, Execution--into a unit training program. However, this is just a first cut for demonstration purposes. It would have to be fitted with other requirements (vertical and horizontal) existent in a typical round out or round up unit. The Capstone chain of command has an ongoing program of command and staff training which this must complement. Each State has important state mission training requirements. There will have to be considerable negotiation to coordinate initial BCST. That all said, a program could look like this:

GENERAL GUIDANCE FOR THE BATTALION TF TRAINING PROGRAM

IDT Training Period: BCST MUTA minus two months: Briefing to battle command staff team: Description of the coming BCST MUTA, general discussion of the scenario, preparatory reading (TV tapes) suggested for each individual and staff team. Reading includes both Staff Task Proficiency and Battle Staff Effectiveness content. At home study packages would be provided with study guides; SME would be available to answer questions, suggest additional material.[13]

IDT Training Period: BCST MUTA minus one month: Two UTA devoted to BCST preparation.

UTA 1: Structured discussion of BCST MUTA. Discuss "What will happen when." "Play" the "what happened summary" from the "a way" AAR. Review the "your way" Context material. OE/OC discussion (from Discussion Guide) of staff requirements.

13 Training for individual staff officers and small staff teams is discussed in greater detail in Chapter 5. "A way" BCST might be executed in a typical Tank Battalion, as indicated in greater detail in Appendix 1.3.

UTA 2: Entire "a way" AAR available to Commander and XO with commentary by OE and OC who will be present for BCST MUTA--and who will be present at MUTA minus 1. Key Staff Teams such as S2, S3, FSO; S1, S4 view and discuss the "your way" Context for their Staff Team with the appropriate OC/OE. All material should be available to be taken home in TV cassette and paper. OC/OE available to answer questions, provide additional doctrinal material for preparation at home or worksite between MUTA-1 and BCST MUTA.

Each staff officer would be provided a copy of the Table derivative Module (TV Tape) for his staff position for review at home. OC available by telephone to answer questions.

BCST MUTA--Selection of Table training opportunities appropriate to the requirements of the unit in training: One sequence could be: Context, Table 7, AAR, Refight Table 7, AAR, Table 7 with "What Ifs" (essentially still a Coordination Table), AAR, Table 7 with "What Ifs" (now a Staff Action Table), AAR.

Post BCST MUTA--Documentation available to support BCST prior to and during the scheduled MUTA should be equally available and suitable for individual or small staff group remedial training. OCs and OEs should be competent to suggest appropriate training. Armed with the "your way" record and the "a way" training support material for the Table, they should be able to stimulate both scheduled and "opportunity" unit training as well as individual and small group training. This material could be supplemented by Context, Module, and AAR material previously prepared for individual staff officer and small staff team training. See Chapter 5. This all assumes the continuing local availability of an impressive inventory of training support and that the trainers are tactically and technically competent.

TRAINING SUPPORT

Quality training support will be essential to execution of BCST.[14] Specific validated training support packages will be required. Trained OCs and OEs are a "must" for this intensive distributed training. The chain of command must be "in sync." The training will have to be analyzed to ensure that it does in fact achieve the results desired in

[14] This is a major but not insurmountable requirement. Starting with the CTC, the infrastructure of quality training has been recognized and executed exceedingly well. Think of BCST--and Platoon and Company STX Lanes and Tables, for that matter--as CTC type training exported by technology to the Armory. Done well, it is superb, the subject of great soldier satisfaction. Done poorly, it is devastating. Garbage in, garbage out.

average units. Lastly, units in training will need support to free them from the tyranny of peacetime administration while they focus on warfighting.

OC/OE Pretrain

OE: Their training requirement includes basic civil organizational development facilitator skills as well as training in the Organizational Competence processes described in the Olmstead model. Most of the instructional material required to train Tables and Modules should be available for OE preparation as a byproduct of preparation of the general BCST Tables and Modules. For example, BSE Probes appropriate to Tables/Modules and documented in "a way" AARs should be appropriate for OE training. Of course, OEs must be generally familiar with tactical doctrine, tactics, techniques, and procedures so that they can put their comments into the proper tactical context. There will be some overlap with OC preparation in this area. OE support of BCST will probably be Guard-unique, at least initially.

OC: Same Program of Instruction as is employed for Combat Training Center OC preparation. In addition there will need to be a detailed introduction to virtual and constructive simulation so the OCs can "fill in" the TES blanks. That is, they know what is missing in TES due to the characteristics of the various simulations and why and how to compensate, particularly in the AARs. As is the case for OE preparation, the quantity of BCST Table and Module training support material prepared for BCST training should be more than sufficient for OC training. The various Proponents should be responsible to ensure that OCs are functionally proficient. Actual OC validation should be accomplished by the CTC or whatever mechanism is used to validate CTC OCs. As evidenced on Desert Storm, the CTC validated for maneuver unit deployment upon mobilization. They should also establish the standards for mobilization before mobilization.

Chain of Command Pretrain

This training is different--both the scope of the training itself and the technologies employed in conducting the training. Most chains of command, up and down, will require a general orientation on the purposes of the program. There will be natural curiosity as well as normal resistance to change. Questions abound. Why is what being done when? How can the chain of command best support and why? Several specific items seem necessary for chain of command preparation:

- It is very difficult to understand the power of simulation--particularly virtual simulation--if you have not experienced it. This is not experience by briefing. It is learning by doing. You need to become totally committed to battle outcomes to understand the intensity and training potential provided by the simulation. Prior to starting the training, senior leaders should experience immersion in virtual simulation by direct ego-committing personal involvement.
- There is understandable concern about embarking on new and different programs particularly with commanders responsible for continuing unit readiness. Total Army leadership should explain the objective training strategy and how the BCST program fits into overall CATS planning.
- Whatever the chain of command believes to be necessary to explain the program to subordinate personnel should be provided. Leader preparation is not the place to conserve resources.

ARI TEA

An elaborate infrastructure of Training Effectiveness Analyses will be required. This will be determined as the BCST action program is developed.

TEA should address not only the training effectiveness of the various proposals with appropriate baseline in test units and control units, but also, they should address such issues as:

- Actual compression of training time achieved through immersion in the tactical scenario.
- Maintenance of quality training to standard despite exceptional distribution to small units.
- Structure of Staff Task Proficiency and Battle Staff Effectiveness tasks.
- Utility of the training across component (Capstone traces).
- Terminal proficiency achieved in distributed training compared to that achieved at CTC.
- Applicability of the training to likely allies.

Whatever the evaluation program, intensive orientation of the analysts will be required.

Administrative Support

Support personnel requirements need to be developed such that the unit undergoing BCST has no additional support requirements in order to enable the training. In other words, when unit BCST is under way during IDT, attempt to insulate the unit chain of command so they can in fact afford to become immersed in the very intensive training. If not, the frustration level will be very high. More important, the precondition for achieving the levels of effectiveness and efficiency in BCST--immersion--will not be met. All will be disappointed.

PREPARATION FOR VERTICAL BCST

This is a separate and distinct problem of preparation. Vertical BCST is discussed in detail in App. 1.2. There is a substantial challenge to conceptualize, then routinely create the various vertical teams--not a unit but a cohesive vertical BOS team composed of BOS expertise up the Capstone chain of command. It would seem that this process--both identification and grouping for collective "vertical" training--should occur under the overwatch of the Proponent who would assume a dominant role as the developer of "vertical" bonding requirements. Execution of the training would take place in the unit probably under close scrutiny of the CINC who would command the deployed vertical capability.

It seems presumptuous to suggest specific preparation when neither the composition of the vertical "team" nor the tasks for training have been established. Nor have the joint or combined (allied) implications been developed. Vertical BCST--Fire Support--clearly needs to be initiated so that these issues can be addressed with experiential data. A likely sequence for vertical BCST development is described in App. 6.1.

5. SUPPORTING INDIVIDUAL AND SMALL GROUP TRAINING

The primary focus of BCST to this point has been training of the entire unit staff as a team. Now to look more closely at the execution building blocks of successful unit staff performance; that is, the training of individual staff officers and small staff teams which must precede their performance as competent staff officers in a Brigade- or Battalion-size unit. The purpose of this chapter is to present a concept for the preparation and conduct of training required to train individuals and staff teams such that they possess at least the minimum level of tactical and technical competence required for the unit as a whole to perform "crawl" level Coordination BCST Tables to standard. Hopefully these individuals and staff teams can be prepared well beyond basic proficiency. Some will become highly proficient; the challenge is ensuring that all meet a minimum standard so that there is a productive collective training experience.

The broad requirements for individual and small staff team training have been established in previous chapters:

- Staff Task Proficiency requirements are described in the various doctrinal sources, particularly the Combined Arms Battle Tasks developed by ARI POM in support of CAC-T and the Combat Training Centers and the appropriate ARTEP-MTP. Individual staff officer tasks, conditions, and standards are stated; explicit statements of various MOP or MOE of individual staff officer performance tied to specific Modules are yet to be prepared. Small staff team tasks, conditions, and standards are not yet defined explicitly although they can be inferred from existing documentation as was done above for both individual and staff team tasks in Appendix 2.3, MOP/MOE Development, which addressed the S4 and the S2, S3, FSO small staff teams as illustrative examples.
- The Battle Staff Effectiveness (BSE) model proposed by Olmstead defines the requirements for organizational competence. Training to develop these competencies should be part of the training packages for both individual staff officers and for small staff teams. While the primary BSE focus is on development of organizational competence for the entire staff team, individual staff officer training also should include training in selected processes of

organizational competency such as sensing, communicating information, communicating implementation, and feedback. Clearly high performance interpersonal relations are important to an effective staff team and therefore need to be included in the conceptual model.[1]

- The staff performance model involves both training by echelon (horizontal) with the initial focus at Battalion and Brigade echelons and training by Battlefield Operating System (vertical) from the smallest tactical unit such as the Engineer Platoon to the highest tactical echelon. For Mobility, Countermobility and Survivability BOS, this is the Engineer Brigade at Corps.[2] Horizontal BCST is well understood; vertical is not. Still to be defined rigorously are the composition and shared responsibilities of the various vertical staff teams which must exist to ensure effective, efficient focusing of the combat power of each BOS as well as the synchronized focusing of combat power across several BOS which lies at the heart of Airland Battle doctrine. The vertical Fire Support "family" or team is probably the best understood vertical staff team. For that reason, the Fire Support BOS has been selected as the first vertical BCST to be developed.[3]

- Three levels of individual staff officer or small staff team training Modules appear appropriate for horizontal training and probably for vertical training also. As portrayed in Enclosure 3, Appendix 3.1, Coordination, Tactical Action and Reaction Tables are proposed in a "crawl, walk, run" sequence of increasing complexity of mission, friendly strength or enemy composition. In addition, the complexity of the staff actions is increased as friendly units involved in the BCST change from single service (Army alone) to joint to combined operations with allies. As the Tables progress in difficulty, so should the Modules derived from the Tables and designed for preparatory individual staff officer or small staff team training.[4]

1 Serious work continues to develop improved staff organizational competence. One promising example under way for ARI-POM is Zsambok, Caroline E., Gary Klein, Molly M. Kyne, David W. Klinger, *Advanced Team Decision Making: A Developmental Model*, Klein Associates, Inc., June 15, 1992.

2 For a graphical representation of the vertical and horizontal interactions, see Figure 1-1, Chapter 1.

3 The Olmstead Model is related to vertical "Battle Teams" in Enclosure 1, App. 1.2, "Vertical" Synchronization.

4 This sequence also appears particularly appropriate for institutional training. See Chapter 6. There is another advantage to having Tables and Modules of varying difficulty. That is the potential for adaptive testing as well as adaptive training, as suggested by Dr. Howard McFann, ARI POM: "...you will have an array of instructional modules or blocks which vary in difficulty or complexity. You have staffs first try a module of medium difficulty and then see how they do. If they are not able to do the particular module then you cycle them down to a lower level. If they do fine then you cycle to a more difficult level. The advantage is you quickly determine the level appropriate for the group and maximize use of training time. This is in contrast to a fixed sequence approach where every group starts with the easiest and moves to the more complex." Ltr to Author, Comments on Instructional System For Battalion Training, March 25, 1992.

- Additional instructor expertise is required to train Battle Staff Effectiveness and Staff Task Proficiency to individual staff officers or small staff teams. Observer Controller (OC) responsibilities introduced in the Combat Training Centers seem appropriate in support of Staff Task Proficiency training of individual staff officers and small staff teams. OCs prepared to support unit BCST should be equally capable of mentoring individual staff officer and staff team preparation. The same logic should apply in developing Battle Staff Effectiveness (organizational competence) within the small staff teams. OEs will need to be trained to support these teams, particularly the vertical teams accustomed to being separated (vertically in the chain of command) in battle as they normally are in peacetime.[5]

THE TRAINING MODEL

As summarized above, the broad direction for design of the training for the individual staff officer and small staff team has been established. Now to the mechanics of implementation of the concept--the design and implementation of the basic model. Before description of the basics, however, one important caveat has to be stated. The success of all which is described here is critically dependent on the genuine, positive support of the chain of command. After all, particularly at the Battalion and Brigade echelons, the chain of command as it expresses itself to subordinates is what is being provided the tactical BCST training. Whether during IDT or entirely "God and Country time" the mental energies of key senior leaders will be diverted from peacetime administration, the "bread and butter" concerns of State. The Battalion or Brigade S3 or S4 in BCST will not be available for support of important State programs as his or her focus is on the development of warfighting proficiency.[6]

Time for unit BCST is visible. It can be scheduled, protected, then intensified by the various measures suggested in this Paper. Individual staff officer training in the institution such as C&GSC can be scheduled and protected. It will be far more difficult to set aside and protect the time required to train in the unit or vertically across multiple units in individual staff officer or small staff team Modules. This is a problem of "eaches"--important training without the priority afforded training requirements when the full unit

5 Developing the smooth functioning required of a high performance team in a distributed vertical group connected only by communications and the shared doctrine, tactics, techniques, and procedures of a BOS is a non-trivial challenge. Considerable training development effort will probably be required. OE preparation is discussed further in Chapter 4.

6 This is the desired level of support. Clearly natural disasters and comparable state crises will preempt the unit chain of command upon occasion.

staff is involved. Yet this training is essential to develop the basic task proficiency required to enable productive unit BCST Table training. Therefore, the attitude of the leadership from the TAG down must be genuinely supportive of individual and small team development. Positive incentives such as additional pay for BCST training time and/or promotion or similar acknowledgment of performance will be essential. Conversely, there should be negative policies associated with unsatisfactory performance. Without motivation and "teeth" provided by the chain of command, the levels of individual staff officer and staff team proficiency necessary to enable unit BCST to fight and win at Airland Battle doctrine will simply not be attainable by the majority of combat Battalions and Brigades. Now, assuming command support, what is to be done?

As it is for unit BCST, the primary training vehicle for individual or small staff team training is conduct of an AAR after experiential "learning by doing" executing a Module or subset of a Table previously developed for use in unit BCST. The Module is a "cut down" Table tailored to train individual or staff officer tasks to the explicit MOP and MOE already developed in the Table vignette of a "day of battle." Various potential Tables are described in Chapter 3. As it is in unit BCST, individual staff officer or small staff team training is envisaged to consist of "a way" and "your way" execution of staff tasks. "A way" is execution of the tasks by a highly competent unit--extracted to staff officer or small staff team tasks--preferably drawn from actual unit (staff officer, small staff team) performance at a CTC rotation. "Your way" is how you, the individual staff officer or small staff team in training, perform the same staff tasks.

There are three components to the training. Context must be established in the mind of the single staff officer or small staff team; the Module is "fought"; finally, the AAR is conducted. Context is defined as all which must be done by the individual staff officer or small staff team to prepare themselves such that they will be able to transition smoothly into the warfight at the instant of initiation of the simulation (constructive or virtual). Context is shorthand for all which must be done in preparation. The Context training package differs from that envisaged for Pretrain in unit BCST. It is less because it does not involve preparation of the entire unit as is the case in horizontal or BOS staff as in vertical unit BCST. Only that information required for task performance as the individual staff officer or small staff team is presented. The Context training package is more than unit BCST Pretrain because it includes both general training on responsibilities of that particular position and specific training material related to the explicit METT-T of the Table (Module)

about to be trained. I would anticipate that at least fifty percent of the instructional material will be general staff training in conduct of various tactical missions. Dependent on the objective of the Module to be trained, this material would be packaged for home study by the individual officer training as an individual staff officer or as a member of a small staff team.

Distributed training is a key aspect of the unit-oriented individual or small staff team training strategy. Since most of the training will be self study, probably conducted at home or work site, we need to draw on predictable anticipation of execution of the Table in front of peers and superiors who want to do well in order to stimulate personal motivation to train. In other words, as you prepare to execute your responsibilities as S-X (1, 2, 3, 4, FSO, etc.) several weeks from now when your Battalion executes Table 7 (Deliberate Defense-Execution) in unit BCST, the training package provided you will not only prepare you for the METT-T of that particular Table--condensed to a Module focused on your position--but also it will train you in the more general responsibilities of your position. In addition you should have received some functional BCST preparation in your "schoolhouse" institutional training. This aspect of BCST is discussed in Chapter 6.

We want to capitalize on individual desire to excel. This does not mean that all will have to complete all of the training. A diagnostic pretest will be provided. You should complete only that general training which the pretest indicates is necessary. The remainder of the Context, that related to the explicit METT-T of the individual staff officer or staff team Module--itself derived from the coming unit BCST Table--should be trained in its entirety. After all, that is what will give you a "leg up" anyway in preparing for the upcoming Table execution. Important training occurs in Context preparation.

The Module draws on a variety of training support to immerse the individual staff officer or small staff team in the tactical vignette while performing tasks appropriate to Planning, Preparation, or Execution of the designated mission. For individual staff officer training, interactive "freeplay" participation in "your way" of performing tasks compared to "a way" the same tasks are performed by a highly competent staff officer is probably both too expensive and unnecessary. Nor may it be necessary for horizontal or vertical staff team training but that will have to be determined by analyses. A paper-based series of situations keyed to channel "your way" to explicit MOP and MOE established by the "a

way" unit to identical METT-T may be sufficient to immerse the staff officer.[7] Videotape should be a useful supplement. Certainly interactive CD ROM drawing on imagery created by virtual or constructive simulation to lead the staff officer through staff tasks should immerse until low cost distributed virtual or constructive simulation is available if that is necessary. The model appears both appropriate and feasible for Staff Task Proficiency.

Stimulation of effective Battle Staff Effectiveness training should be even easier. Immersion of the staff team should excite and involve emotion and personal commitment creating the interpersonnel stresses which feed situations requiring organizational competence--the grist for Battle Staff Effectiveness. The point is that the purpose of the Module is to absolutely immerse the individual or small staff team in the tactical situation so that they are emotionally committed to performance to standard. They want to perform as well as the "a way" individual or staff team did--and maybe "beat" them. This sets up the next important step of training, conduct of the AAR where much of the effective learning occurs.[8]

The AAR would be conducted as discussed in Chapter 2. The AAR is structured to permit the individual or staff team to learn how they performed to explicit MOP and MOE--assessment of "your way"--and how they performed in relation to execution of the same tasks by the "a way" staff officer or small staff team. Clearly we want to encourage a wide range of "your ways" to stimulate thoughtful innovation just as we want to preclude stereotyping of "a way" as the only way. However, execution of some staff tasks is circumscribed by Army doctrine, joint, or allied standardization agreements. There are rigorous prescribed procedures associated with Passage of Lines. Joint regulations govern conduct of Joint Air Attack (JAAT). NATO STANAGS prescribe certain reports in specified formats. These standardized requirements must be trained and reinforced in individual and small staff training both horizontal and vertical. There is no easy answer

7 This is an important issue. Staff officers, normally operating from a Tactical Operating Center, envisage the flow of battle from their tactical map--their "porthole" to the "mind's eye." Imaginative paper-, video cassette-, and audio tape-based training support should stimulate staff officer immersion. For the Commander and his or her command group visual "eyeball" stimulation seems necessary. Virtual simulation provides this today. Hopefully, constructive simulation can provide this in the future. JANUS 3D seems to offer this promise. See foonote discussion, p. 3-8. This is another area for Training Effectiveness Analyses.

8 The relative training importance of each step of the model needs to be determined. My initial estimate is that 40 percent of the training value will come from the general and Module-specific nature of the Context, 20 percent from actual execution of the Module (learning by doing) and 40 percent from the AAR as the individual staff officer or small staff team compares "your way" to "a way" and discusses implications of the differences.

here. Intuitively, individual staff officer training should train the doctrine and alternative tactics, techniques and procedures. Where "one way" is prescribed, training should reinforce that. Then, encourage more variation and innovation in ways combat power can be applied consistent with procedural agreements at the small staff team level.

How this dilemma is resolved on the ground will be influenced by the quality of the OC or OE who conducts the AAR after execution of the Module.[9] He or she should have the "a way" AAR for that particular Module available. This AAR training support material documents "a way" performance of the explicit MOP and MOE as a basis for comparison with "your way" execution of the same MOP and MOE to the same METT-T. In time, it may be possible to remove the requirement for direct OC and OE participation in the AAR, particularly for procedure-based individual staff officer training, without falling into the "only way" trap discussed above. Interactive CD ROM developing the MOP and MOE of "a way" execution including alternative equally valid approaches could perhaps supplement and in fact enable individual self-evaluation of "your way" execution. Institutionalization of distributed individual execution of the model of individual staff officer training in the unit environment (Diagnostic self-evaluation, Context, Module, and AAR) will eventually require stand-alone training packages. On the other hand, Staff Team training cannot be conducted without OE intervention. Small staff teams must have OE support to train and evaluate organizational competencies. The complexity of tasks, particularly those required of the vertical staff team, would seem to mandate OCs also for staff team training to Staff Task Proficiency.[10]

That is the model. There is a considerable development challenge in causing "your way" to happen in virtual or constructive simulation in a distributed setting at low cost even for small staff teams where there are modest economies of scale--several staff officers who can be trained simultaneously. Eventually this same capability should be available for the training of individual staff officers distributed to home or work site. The potential of this approach is high as it involves the staff officer in distributed interactive "learning by doing"

9 It seems highly unlikely that this BCST AAR can ever be conducted by the commander. It is simply too difficult to become disengaged and objective, particularly to assess organizational competence. An objective "third person" who can assess all including the commander is necessary.

10 In review of this BCST paper, Dr. Joseph Olmstead commented that institutionalization of training of organizational competencies could be an appropriate responsibility for the Battalion Executive Officer. Dandridge M. (Mike) Malone commented: "Think of 'OE' skills as 'XO' skills...?" This is clearly a useful research path. For the near term, it may expect too much from the XO. Contemporary ARI-Benning research at the JRTC cited in App. 6.1 indicates serious shortfalls in current XO task proficiencies relating to staff organization and training.

in a training environment intensified eventually by immersion in virtual or constructive simulation.[11] The challenge will be to translate potential to reality.

Important first steps are to structure the design of the training packages (Context preparation, Modules, and AARs) as well as the associated training support appropriate to the distributed individual staff officer and small staff team. Design of the individual staff officer and small staff team training packages should include:

- Modules which are derived from Tables used in unit BCST. Where the Tables are consecutive as are Tables 5 to 7, Deliberate Defense Planning, Preparation, and Execution, the Modules should also flow consecutively. Just as Table 5 can flow into Table 6 then Table 7, so should the various Modules derived from these Tables. Note, however, that for some staff officers such as the S4, a Module based on just 30 or 60 minutes of battle is insufficient, given the nature of staff responsibilities. At least 12 to 24 hours of battle should be represented to ensure that there are sufficient logistic actions. The same considerations apply for vertical staff team training where there are planning cycles of different lengths such as Close Air Support currently generated in days compared with Field Artillery support generated in hours.
- Training packages designed responsive to the National Guard IDT training environment. Training intended to be accomplished at home or worksite such as the Context training should not only be structured for multiple one- to two-hour individual training periods but also the training support must be consistent with home media. Paper, Vu Graph, 35 mm slide and VCR cassette are it for now. Interactive E Mail is feasible for selected individuals. Each individual staff officer training package should include a diagnostic pretest with appropriate entry points for self-paced Context training. Small staff team training packages should enable group-paced training. Assuming that most of the Context preparation is done at home, the Module and AAR portion of the training should be structured in one UTA (4 hour) blocks of time--probably a weekday evening. Of the 4 hours, strive for 30 to 60 minutes of warfighting immersion in the staff position (horizontal or vertical) with the balance in AAR

11 Excellent work is under way in autonomous case-based reasoning. The BCST model relies initially on a paper, video, and CR ROM case library of Modules designed to train individual staff officer and staff team tasks in a combination of interactive Context, battle vignettes and AAR situations which the student must respond to. This methodology has been described as "...a crucial step towards the development of a new generation of computer-based educational software systems, which takes as its fundamental principle the idea that learners must be actively engaged in realistic problem-solving tasks, embedded in realistic situations, in order to properly assimilate lessons in a way that will enable their application in appropriate situations in the future." Shank, Roger C., William Ferguson, Lawrence Birnbaum, Jorn Barger, and Mathew Greising, *ASK TOM: An Experimental Interface for Video Case-Bases*, Northwestern University, The Institute for the Learning Sciences. Undated (1990), p. 10.

guided by OC as well as OE where small staff team Modules (horizontal or vertical) are being conducted. Alternatively, there should be flexibility to permit a "refight" of the Module after the AAR to confirm proficiency--all within the 4 hour length of the UTA. This schedule assumes that all participants are prepared to start the Module when they assemble since they have completed the Context preparation at home or worksite. If not, some additional time will have to be taken from another MUTA to establish Context for Module execution.

TRAINING SUPPORT REQUIREMENTS

It seems evident that there is a broad array of training aids required to support the proposed range of training requirements and opportunities. Various media are television (VCR and cassette), audio tape, paper including photographs (supplemented by CD ROM), vertical "views" of the battlefield (Plan View Display) and "out the window" views of objects on the digital battlefield. A multimedia "case library" has to be created of each "a way" Module with documentation sufficient to support both "a way" Context and "a way" AAR.[12]

Television: Coverage of:

"A way" commander and key personnel receiving the Brigade Order.

Conduct of the Brigade rehearsal with attention focused on the Battalion TF portrayed in the Table/Module.

Battalion Orders Group receiving the OPORD.

Conduct of the Battalion TF rehearsal(Rock drills) of significant staff coordination actions by "a way" individual staff officers or small staff teams.[13]

12 Similar documentation is required of "your way" Module to create the training aids for the "your way" AAR--the most important training event. This should not need to be as comprehensive a requirement as "a way" documentation because data collection can be limited to material directly related to previously agreed explicit MOP and MOE for that Module.

13 This documentation should continue throughout "a way" execution of the day of battle. Context for "your way" Module would use the documentation up to the instant of initialization for the particular Module. After the instant of "your way" initialization, the "a way" documentation would be used as a baseline for development of the "your way" AAR--where "your way" execution of MOP and MOE is compared to "a way" execution of the same MOP and MOE.

Audio: Tapes of Battalion TF tactical voice radio nets

Tapes of key planning discussions by individual staff officers and small staff teams. NOTE: Paper transcriptions may be useful too as long as they do not provide a dysfunctional "crutch" unavailable in tactical operations.

Paper including photographs:

Photographs of tactical maps (comparing ground truth with reported truth on the maps of key personnel)

Much of the Context material (general and Module specific) should be paper-based initially with transfer to interactive CD ROM as digital representations of the battle are available--virtual or constructive.

Plan View Display:

Actual battle trace at important times.

Locations of selected weapons or leaders over time.

Graphical representation of execution of Fire Support Plan by location or by weapon over time.[14]

"Out the window" views:

4D (x, y, z, t) representation of various decision matrices such as the Decision Support Matrix or the Synchronization Matrix.

Key personnel views of the battlefield at selected times.

These are all general uses of the various media described as they might be used to establish context at the instant of initiation of the Module. Once the various individual staff officer or small staff team MOP and MOE are defined, these media will become critical components of the collection plan of "your way" Module execution in preparation for the "your way" AAR--both for the Module AAR and for the "take home" package for further individual or small staff team development.

TRAINING DEVELOPMENT

That is the concept for individual staff officer and small staff team training. Most of the training and technology development is derivative of the effort required to field the more comprehensive BCST Tables. The methodology for developing the AAR and then the

[14] See Appendix 2.4 AAR Training Support UPAS for additional examples.

Tables is described in detail in Chapter 2. In App. 2.3, MOP/MOE Development, five steps are described to translate from task to MOP/MOE to AAR and then to explicit enabling Table. Once the Table is completed, the source documentation should be present for the Modules. It should be amenable to selection almost by inspection. That is, if the Table is correct in task and MOP/MOE representation, the Module subsets reflecting individual staff officer and small staff team should be also. An accuracy check can be done, comprehensively or selectively, by following the five Table-building steps in building Modules. This process is described in detail in App. 2.3 for the S4 and S2, S3, FSO. The array of potential Tables described in Chapter 3 should cover the range of individual and small team staff tasks necessary to be trained at least at the basic Coordination level Finally, Chapter 4 charts a possible unit training program in preparation for Table execution. In discussing general training program guidance, individual and small staff team staff task training are proposed for each of the two MUTAs preceding the MUTA designated for BCST Table training. Sufficient guidance seems provided to develop and incorporate individual staff officer and small staff team training into BCST.

It remains only to determine the TRADOC Proponent responsibilities and begin the development. It would seem sensible to have the Staff Proponent develop the Staff tasks--such as the Intelligence School for the S2. Small team tasks could be determined by the near Battlespace proponent (Ft. Knox for mobile armored forces). These are TRADOC decisions.

6. IMPLICATIONS FOR INSTITUTIONAL TRAINING

While the primary focus of BCST is training in the unit, there are clear opportunities for application of this new training technology in the institution. The training institution is the "schoolhouse"--that part of the support army charged with Initial Entry Training for officers and enlisted soldiers and the centralized professional development of officers and noncommissioned officers. That responsibility is currently vested in TRADOC. By virtue of current technology, that institutional training can be conducted either at the school itself (Leavenworth, Benning, Knox, etc.) or distributed to regional sites and taught by certified agencies such as Army Reserve (USARF) Schools or administered directly by the institution but delivered to unit or home.

The distinguishing characteristic of institutional training is that TRADOC is directly and explicitly responsible for both the content and the quality of the training. While the training conducted is normally individual training (Basic Combat Training, Officers Advance Course), it can occasionally be collective. For example, TRADOC is responsible for the quality execution of collective training of operational units while they are training at the Combat Training Centers.[1] The Combined Arms Command at Ft. Leavenworth conducts the Tactical Commander's Development Course (TCDC) for not only individual Guard commanders enroute to command but also for the commanders and staff of high priority Guard tactical units--the round out and round up brigades.[2] As a general proposition, when it is essential that there be consistent quality control of important training such as initial entry or precommand training, that training is considered for inclusion in institutional training. So there are numerous precedents in institutional support for pre-command training for commitment of the institutional training establishment to the conduct of BCST for Guard units and individuals. Further, there are clear indications that current institutional staff officer training does not fully prepare command and staff to execute

1 Clearly the chain of command of the operational unit remains responsible for the training of the unit. TRADOC ensures that training/evaluation and all of the associated training support is doctrinally correct to standard. Clearly both TRADOC and operational CINC need to work together to support unit readiness training.

2 This responsibility will shortly be passed within Leavenworth from the C&GSC to CAC-T BCTP.

Airland Battle doctrine. There is a need for institutional BCST. See Appendix 6.1, Requirements for BCST in Institutional Training.

Institutional BCST can take several forms. First in priority and most common is the training of the individual staff member, officer or noncommissioned officer. This occurs most often at the "schoolhouse" in a prescribed course of instruction such as the Officers Basic Course where the individual joins with peers from other units to receive training. However, it is also possible to provide institutional training to individuals in their unit context when the unit itself is brought to the "schoolhouse" or to a regional location. Now, with distributed information technology, it is becoming feasible to transport the institutional training of individuals to the unit in the unit locale (Armory). This latter capability appears particularly attractive for the Guard. It provides the potential assurance of TRADOC quality without the burden of travel.

A second form of institutional BCST could be TRADOC conduct of small staff team training (S2, S3, FSO). This would most likely be to train existing staff teams in operational units although there could also be applications in the training of individual staff officers in various staff positions by rotating "round robin" through the positions in a small staff team either in the schoolhouse or as conducted regionally under schoolhouse quality control. For example, a high priority battalion or brigade assured continuity of personnel assigned to critical staff positions such as S3, S2, and FSO could want to reinforce the effectiveness and efficiency of that staff team by having the S3 serve as the S2 then the FSO in executing small staff team BCST Modules. By so doing, each in the team more fully understands the responsibilities and staff planning requirements of the other team members.[3]

A third type of institutional BCST could be BCST training of the operational unit as described above for TCDC. In this case, the unit currently has to come to the institution. TRADOC could also enable the training of the unit commander and staff by bringing the training support directly to the unit as is done today in execution of the Battle Command Training Program training for Corps, Division, and Brigade staffs. Evaluation can be conducted either internally by the unit in training using its local OC and OE or externally perhaps by the Capstone contingency chain of command.

[3] These kinds of training exercises would also be applicable to training with potential allies in contingency operations.

There is a wide array of new institutional training opportunities. It is evident from the array above that the quality control enabled by distributed simulation should permit new forms of institutional BCST training. Resident training in the schoolhouse remains as the traditional venue. However, as force reductions accrue, this alternative will be less and less available for many Guard individual staff officers and small staff teams requiring training now associated solely with the institution such as branch competency development and validation.

Distributed alternatives which retain the traditional quality of institutional training become more important too. Non-resident institutional regional BCST training could be supported through some capability analogous to the USARF School using Tables and Modules prepared for unit training. Regional quality control could extend further to BCST conducted in the Battalion Armory if the selection of Tables and Modules were prescribed by TRADOC and if the actual training including the AARs were to be conducted by OCs and OEs trained by TRADOC or the CINC/CAPSTONE unit. This latter aspect of TRADOC quality control is what distinguishes the individual staff officer and small staff team training in the unit from similar training appropriate for building then validating proficiency for professional development purposes. In Chapter 5, the training is conducted within the Capstone "go to war" chain of command. In Chapter 6, we are discussing very similar training conducted by TRADOC. There should be a convergence in content here--actions occurring on a common synthetic battlefield--which should increasingly erode the distinction between training in the institution and training in the unit.[4]

DEVELOPMENT GUIDANCE

Application of BCST to institutional training should be governed by the following:

- **All of the training is conducted in a warfighting environment.** That is, the staff officer or staff team in training is taught by personal immersion in specific battle situations requiring personal action. When personal preparation is required, the context for individual study is preparation for a coming warfighting situation. But even here, whenever possible, the learning is by active interaction with an ongoing tactical situation rather than passive reading of abstract theoretical material. The technology challenge is to develop this interactive context in exportable format at low cost--such as CDI--interactive CD ROM. The training developer's challenge is to design the

4 It would seem reasonable to expect similar convergence between AC and RC training as the distributed schoolhouse with standardized Tables and Modules is available to both.

Modules such that there is appropriate tactical content to "feed" the training objectives of the instruction.[5] The continuity of immersion in warfighting is even more important for vertical small team training. The "glue" that binds the vertical team is the web of vertical responsibilities and interactions established by doctrine, tactics, techniques, and procedures. These are all associated with warfighting. Without the discipline and attraction associated with actual battle requirements--the need to quickly put together Counterfire (a vertical Fire Support challenge) or provide rapid reconstitution to a battalion-size unit with very high personnel and material losses (a CSS challenge)--it will be very difficult to assemble the vertical team in peacetime. Abstract, theoretical BCST instruction is challenging in the schoolhouse; it is not feasibly distributed to busy units with competing requirements.

- **Training support material is designed such that the same package applies for both resident and non-resident regional (USARF) instruction.** Some modifications may be required for non-resident local instruction but this should be kept to a minimum. For example, both resident and non-resident regional instruction can be conducted with OCs and OEs trained and evaluated repetitively by TRADOC. Less frequent quality control can be maintained over the non-resident local training. Therefore the nonresident local training package should provide more detailed guidance for OC and OE on how to achieve specific training objectives. Of course, standard packages based on warfighting situations to uniform METT-T in distributed virtual or constructive simulation will provide major new opportunities for quality control. "A way" execution of a specific MOP or MOE in a particular Table or Module is absolutely consistent from schoolhouse to regional USARF school to local Armory execution. Consistent, fair, performance evaluation is now possible across a distributed institutional training base.

- **Institutional BCST is drawn from the Tables and Modules prepared for individual, small staff team, and unit staff training in the unit.** The bottom line of all training is the successful performance of units in battle. Developing institutional training material from that actually in use in units ensures training base congruity with the operational unit. In addition, commonality of situations provides a common bank of shared experiences and relative uniformity of preparation across institution and field. Perhaps more important in the future, it ensures common training experiences

5 This may seem difficult but recall that in Chapter 2 there was lengthy discussion of the development process required to ensure that the desired MOP and MOE are reflected in the AAR. Basically, Tables and Modules are constructed to ensure that the proper battlefield actions occur to enable the intensive learning of the AAR. The same thought and action process is required to develop the tactical situations required to support the training objectives of the distributed interactive institutional instruction.

across both active and reserve forces.[6] There will be significant training support available for institutional training just as a byproduct of training development for unit BCST. Recall that the unit BCST package consists of Context, Table or Module, and AAR. As part of the training development process, a competent unit "fights" the tactical situation demonstrating "a way" the mission can be accomplished to standard. Elaborate documentation is required of "a way" so that the various MOP and MOE of both Staff Task Proficiency and Battle Staff Effectiveness are produced. This "a way" documentation drawn from several Tables (attack and defend) and their derivative Modules for individual staff officer and small staff team training is the grist of institutional BCST. In fact, it would seem that much of the Context material discussed above in Chapter 5 for staff officer and small staff team train up in the unit in preparation for conduct of BCST would be directly applicable for institutional training.[7] "A way" AAR material from unit training such as the 4D visualization of the synchronization matrix for a particular unit Table would be superb training support for institutional training. Rooting both unit and institutional BCST in common Tables and Modules seems both logical and necessary in a period of declining resources.

- **Institutional BCST should consist of Tables and Modules reflecting different levels of proficiency.** "Crawl, walk, run" is widely accepted as an appropriate sequence of training normally reflecting task training to standard but with increasingly challenging conditions. Increasing difficulty normally is associated with reduced capability of friendly forces or increased and often unexpected enemy. The rigor of advanced distributed simulation permits variation of each element of BCST. Orientation on terrain can be changed (new objectives or boundaries) or time available can be compressed.[8] Suffice to say, the task, condition and standard of the training experience can be controlled closely. The issue here is more one of training philosophy: What should be taught in the institution? Tables with different levels of difficulty are wholly appropriate for unit training.[9] Dependent on the

6 The same advantages accrue when training joint or potential allied forces. In both cases, the quality training to standard can be easily exported overseas to be available for regional CINCs as is being done drawing on distributed constructive simulation for Reforger '92.

7 Another example of the potential convergence of BCST training in unit and institution. This alone would amortize the sizeable cost of development of BCST employing advanced distributed simulation.

8 For a detailed description of possible variations in METT-T which can be reflected in Tables or Modules, see Chapter 3.

9 Although there are those who believe that Tables are appropriate for Basic Coordination exercises only. To them, more complex training should be conducted in a Situational Training Exercise (STX) framework responsive to the various METT-T which can govern contingency operations. Freezing METT-T in Tables in other than very basic warfighting situations will result in a stereotyping or reduction of the individual command initiative which has been a very successful hallmark of the American Army. Clearly there is a point beyond which all training should be by STX. That point needs to be established by TEA.

time available for deployment, units are maintained at varying levels of training readiness. Units which have time to train after mobilization can maintain safely lower levels of peacetime training proficiency. Is that variation appropriate for institutional training?

I believe that it is. As long as institutional training remains, there are clearly distinguishable levels of difficulty in premobilization BCST proficiency requirements which are applicable to individual staff officers and small staff teams as well as units. Staff officers serving in units anticipating quick response contingencies involving joint and combined operations with allies need to experience combat-analogous training situations--vertical and horizontal--in institutional training. In fact, institutional training may be most appropriate (and acceptable) for some potential regional allies where a direct tie to U.S. operational contingency units may be inappropriate. The case for multiple levels of BCST seems clear for AC staff officers particularly as the training institution is expected to come out to units to support contingency training as is done in the Combat Training Centers particularly BCTP.[10] Staff officers in Guard Capstone units traced to these high priority active units need enabling institutional training. Execution of that training seems too great a training burden to place on the Guard unit chain of command even when provided competent OC/OE training support. Therefore, Modules reflecting increasing levels of difficulty are necessary for Total Force BCST. This need seems clear for horizontal BCST. It should be more necessary for vertical BCST where techniques and procedures demanded to advantage Airland battle doctrine can become quite complex. While sustainment of BCST proficiency is clearly a unit responsibility, institutional training to varying levels of proficiency in vertical orchestration of the various BOS seems essential.

- **The basic design of BCST should support the time constraints of reserve training.** Time is measured in Unit Training Assembly (UTA) blocks of four hours duration. Therefore, the training should be designed to permit four hour time blocks. The issue is much more than facilitating scheduling. Time utilization is of such criticality to the reserves that it should be one of the primary determinants of training design and development.[11] In an earlier Chapter, we discussed the necessity of design of all of the training to support the AAR--the single most valuable training experience of BCST. Use

10 Varying levels of difficulty can also provide useful intellectual stimulus for quality officers potentially dismayed by fewer training opportunities in the future.

11 Time is also severely limited in the active force unit always facing competing demands. But the AC have flexibility to use effectively various periods of time which the reserves do not. Extending the training to go over something again "the next day" is seldom available to the Guardsman facing the tyranny of the MUTA schedule.

of time falls in the same category. It is a driving factor. The entire BCST institutional training experience should be designed that it can be executed successfully by average individual staff officers, small staff teams or units in four hours. That is, tasks selected to be trained are grouped such that Context, Table or Module and desired AAR can be conducted in four hours. Narrow training objectives to that which, by TEA, can be done well in four hours. This guidance is applicable to resident, nonresident regional and nonresident local training. Not only does this rigor encourage learning by tailoring a positive learning environment--design of the training for task proficiency (success)--but also it facilitates distributed quality control. The OCs and OEs responsible to mentor the nonresident local institutional training will be trained and evaluated to the same blocks of BCST training in a resident institutional context drawing on the quality of the schoolhouse. In addition, individual staff officer Staff Task Proficiency Training trained in the institution in four hour blocks should be supportive of self study at home or in the worksite before or after the institutional training. In execution, this bloc would probably be quite similar to the Context training support for the individual staff officer preparing for unit BCST Table execution discussed in Chapter 4. Structured to four hour blocks, much of the institutional training material should be applicable for unit training.

- **All institutional training should employ the same training strategy and training support whether conducted in resident, nonresident regional or nonresident local mode .** Often the schoolhouse has special training support optimized and justified based upon economies of scale available only with centralized training. The individual Guardsman training at the schoolhouse sees training support unavailable for use back in the unit. Institutional use of SIMNET itself falls in this category for all but several high priority units. He or she is not "learning by doing" as they will subsequently train in their unit because the training technology is simply unavailable. The reservist attending nonresident regional training suffers from training also deprived of schoolhouse training support and therefore different than that in the schoolhouse. This difference is exacerbated as the courses are taught by instructors of widely varying ability who have seldom attended the schoolhouse course.[12] There is no local institutional training. BCST employing advanced distributed simulation, constructive or virtual, offers the potential to correct this by providing a common training experience across Components.

12 These are generalizations but nevertheless represent the situation for most BCST taught today in the RC versions of the Officers Advanced Course (OAC), the Combined Arms and Services Staff School (CAS3), and Command and General Staff College (C&GSC).

Converting potential to validated performance will be challenging. The training development part of the challenge should be satisfied by following the training model proposed. Context, Table or Module, and AAR will train warfighting BCST tasks distributed across the institution--resident, nonresident regional, and nonresident local as a result of the modularity recommended above combined with the crosswalk to similar BCST which should be occurring in the units. Shaping the institutional training to existent training technology will be more difficult. Yet most of the necessary means are present or coming. Both virtual and constructive simulation are subject to major national development programs, both governmental and private. Instrumentation at the Combat Training Centers is becoming sufficiently rigorous to permit documentation of "a way" in paper and TV, both real time and by recreating the battlefield, in virtual or constructive simulation. While distributed interactive communication remains in the future for many Guard units, CDI (Interactive CD ROM) and TV cassette could provide a low cost vehicle to bring the synthetic "immersion" battlefield into the Armory. Whatever the specific technology deemed appropriate by the Proponent, *the critical decision rule is to design the training support for all institutional BCST so that it can be conducted in a nonresident local mode.* Develop to accommodate the most difficult requirement which is also the environment which holds the highest potential for materially improving the BCST of the majority of the Total Force!

Those are six developmental guidelines. They suggest that there is imminent opportunity to change significantly the substance and quality of institutional training for the Total Force. Of equal interest, distributed quality control enabled by the training strategy itself (Context, Tables, and AAR) combined with distributed immersion simulation (virtual or constructive) may converge institutional and unit BCST training. It is apparent, however, that trained OCs and OEs will be essential to successful implementation of this institutional training strategy, particularly for nonresident local training in the Armory.

PREPARATION OF OCs AND OEs

Competent OCs are critical to conduct of BCST in institutional training. They are the credible Subject Matter Experts (SME) who guide the training experience required to achieve Staff Task Proficiency. When unit BCST training is conducted in operational units, the OCs are normally AC officers serving as Advisors or in Readiness Groups. In institutional BCST, the OCs are *de facto* the Instructors. Essentially they conduct small group instruction of either individual staff officers or small staff teams. Dependent on the

situation, they can role play as the unit commander or the executive officer in order to stimulate actions either in Context, Table or Module execution, or AAR. To do this effectively, they must have mastered the training support. They are absolutely familiar with the capabilities and limitations of the various training technology alternatives and they know the Table and Module tactical situations in detail. For resident training, the OC is the normal schoolhouse instructor. Normal Instructor selection criteria and preparation appear fully adequate.

Nonresident regional training is currently conducted by USAR officers. While many are highly competent and are genuine students of doctrine, few have actually served as commanders or staff officers in operational tactical units. Thus they face genuine difficulties mastering the doctrine, tactics, techniques, and procedures to the level of detail required to mentor in situations of stressful interactive immersion training involving all staff positions and small staff teams--exactly the training environment sought in BCST employing virtual or constructive simulation. Thus it seems essential that the Instructors (OCs) in nonresident regional institutional BCST be active or reserve officers with active force experience as battalion or brigade commanders or senior staff officers. These officers should be subordinate to TRADOC with full TRADOC quality control.

The same experience requirements prevail for nonresident local training. Now however, the institutional training has been exported well beyond the command stretch of TRADOC, so exceptional measures are required to ensure the quality of the training. The instructors (OCs) should be active so that there is a rich bank of personal experience in combat or CTC to draw upon. These personnel could be serving as Advisors to the Guard units or be members of Readiness Groups. They would be subordinate to FORSCOM however TRADOC should be responsible for their preparation. In addition, TRADOC would prescribe the explicit training and evaluation requirements since the training remains institutional. Quality control of execution would be a FORSCOM responsibility.[13] OC preparation should not only include classroom training on observation, recording, and AAR feedback techniques, but also should include actual rotations to CTC's for full OC certification

OEs, while essential to developing Battle Staff Effectiveness (BSE) within a unit staff, have a lesser role in institutional BCST. They do not appear required for individual

[13] This command arrangement may seem awkward. It has, however, been proven in joint "ownership" of the NTC, JRTC, and BCTP.

staff officer training.[14] They could counsel small staff teams and unit staffs undergoing institutional training on the processes of organizational competence. While tactical and technical competence in tasks associated with Staff Task Proficiency are useful to training BSE, it does not seem vital. More important is practical knowledge of and experience in Organizational Effectiveness (Organizational Development). Thus OEs could be reserve personnel for the nonresident regional and local institutional training. The sharing of responsibilities for execution of the BSE training would be as it is for OCs.

DEVELOPMENT OF INSTITUTIONAL TABLES AND MODULES

While Tables and derivative Modules are largely identical for institutional and unit use, there are several important differences which may influence development of the base Tables as they are being constructed for unit BCST training. They are:

- Although the full range of ARTEP-MTP missions is appropriate for Table training in units, institutional training should focus on two essential missions--attack and defend. The specific METT-T should be selected to include, if possible, the full task list for individual staff officers and small staff teams as described in the Plan, Prepare, and Execute sequence of the Combined Arms Battle Tasks: Defend and Attack. In other words, institutional BCST training in these two basic missions should expose the trainee(s) to most of the likely staff tasks. Initial BCST AAR and Table development for BCST training in units should consider this institutional training requirement.

Hopefully the METT-T for institutional BCST can be crafted to be roughly similar to those selected for unit Tables or Modules anticipated to be used frequently. Similarity conserves training time. If the individual staff officer or small staff team becomes generally familiar with the general scenario for unit BCST Table training while he or she is undergoing institutional training, they will have fewer Context problems in preparing to conduct BCST in the unit. Similarity should also ease the training development burden of preparing Tables and Modules for both institutional and unit training. Try to have several unit Tables fill as many of the institutional training needs as possible.

- As the unit BCST training support (Context, Table/Module, AAR) is being developed, proof it in resident instruction so experience is being gained in institutional applications throughout the development process. Training

[14] The desired end result of individual staff officer training in the institution includes development of staff interaction skills as well as mastery of BOS. OEs may or may not be required to actually conduct this institutional training.

support discussed for unit BCST in Chapter 4 should be equally applicable to institutional training. Evaluate it in resident, nonresident regional and non-resident local modes as unit development proceeds. This evaluation should extend to CTC validation.

While initial development of institutional BCST will focus on the unit-institutional convergence discussed above, there is another potentially more important BCST training role for the institution. Applied to professional development officers courses (CAS3, CGSC, perhaps OAC), the emerging technologies could be harnessed to train, perhaps to educate, the "graduate" skills--the finer understanding of not only *what* and *how* but also *why*. Comparable to the School of Advanced Military Studies (SAMS) experience at Leavenworth, immersion applications of BCST can be used to educate the art of war--the arcane, the exceptional tactical situations which distinguish practitioners from masters at every echelon. There seems to be an exceptional opportunity to educate offered by immersion BCST. Citizen soldiers need to be exposed to these kinds of training experiences. The challenge is to mold the technology to create these kinds of new officer preparation opportunities designed to be available for the attentive and motivated citizen soldier.

Application of BCST in the institution, resident and exported, both in TES appears to have great potential.

7. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this Paper has been to propose distributed simulation-based training development policies and programs to cause an order of magnitude improvement in Battle Command Staff Training (BCST) for Army National Guard Brigade and Battalion size units. The approach is to hypothesize training policies and programs for the Army National Guard which will ensure trained combat unit staffs for the Guard concurrent with DARPA development of the technologies necessary for competent execution of the proposed training strategy to standard by average units distributed across the United States.

The Paper draws extensively on a preceding effort which describes a general simulation-based intensive training strategy for National Guard combat units.[1] That effort focused on unit training readiness primarily at company and below. General principles governing the design of Battle Command Staff Training were proposed but there was insufficient detail to permit development of specific training strategies and programs. That detail is provided in this volume which discussed General Principles to guide development, structuring of the AAR, design of the BCST Tables and Modules, preparation of the unit for BCST, training of individual staff officers and small staff teams, and potential application of the training strategy to institutional training.

CONCLUSIONS

BCST development should be guided by several practical guidelines. They are:

a. The key to BCST training development is highly effective After Action Reviews (AARs) which train to required individual and staff team competencies. BCST pretrain modules (Context preparation) are required to prepare the unit trainers, OCs and OEs to conduct distributed quality BCST to standard. Design the training to support the AAR such that OCs, OEs, or unit trainers can conduct distributed training to standard.

1 *A Simulation-Based Intensive Training Readiness Strategy for the Reserve Component*, IDA Paper P-2611, December 1991.

b. BCST Tables (Modules) must be developed to enable distributed training to prescribed individual and team (staff) competency as defined by performance on Measures of Performance (MOP) and Measures of Effectiveness (MOE).

c. Individualized (self-paced) training programs are required to develop competency in individual command and staff positions and small staff teams by Battlefield Operating System to ensure effective, efficient BCST. Individual staff training programs complementary to the Tables and Modules and supportive of the AAR are required.

BCST is a new model for staff training incorporating several novel conceptual approaches. These approaches and explicit development actions which they mandate are as follows:

BCST = Task Mastery + Effective Staff Teams

BCST focuses on training staffs in two major areas. The first is command and staff mastery of the individual and collective tasks prescribed by Battlefield Operating System by the TRADOC doctrinal proponents. This is defined as *Staff Task Proficiency (STP)*. It must be developed by individual staff officers, by small staff teams and by the unit staff as a whole. These tasks are trained and evaluated by Observer Controllers. The second component of BCST is *Battle Staff Effectiveness (BSE)* defined as individual and team mastery of the processes of Organizational Competence and Battle Staff Integration. These skills are trained by the chain of command with support and evaluation provided by OCs trained in Organizational Effectiveness skills (OEs).

Actions: Define Staff Task Proficiency drawing on the appropriate ARTEP-Mission Training plan and the Combined Arms Battle Tasks and emerging vertical Combat Critical Functions prepared by ARI-Presidio of Monterey for the Combined Arms Command.[2] Battle Staff Effectiveness is defined in IDA Paper P-2560, *Battle Staff Integration*, February 1992. Training is required for each principal staff position (S1, S2, S3, S4, FSO, XO), each small staff team (S2, S3, FSO; S1, S4) and the unit staff as a whole.

Develop appropriate training packages to prepare the chain of command of the unit in training as well as OCs and OEs to support the distributed BCST.

2 ARI Presidio of Monterey Field Unit, *Design and Development of a Model Training Strategy for a Brigade Combined Arms Combat Team*, August 25, 1992.

Performance-Based Staff Training

New TES (virtual, constructive and subsistent simulation) permits redesign of Battalion/Brigade echelon command staff training to technical and tactical proficiency (i.e., measurable warfighting outcomes of staff actions) rather than mastery of the steps of staff actions which has been the traditional approach. Effective, efficient staff process is important but it is not the objective of staff proficiency. The criterion of merit of command staff performance is integrating BOS to achieve warfighting success consistent with the commander's intent. BCST trains by repeated command staff immersion in battle and effective AARs. Process complements performance as it must in battle.

Actions: Create structured BCST training incorporating virtual, constructive and subsistent simulations to involve the trainee in tactical situations requiring task performance to standards defined by explicit warfighting-related Measures of Performance and Measures of Effectiveness.

Airland Battle Mandates Both Horizontal and Vertical Staff Training

To execute Airland Battle doctrine, BCST must address both horizontal (unit) and vertical (battle functional areas) staff actions. Horizontal BCST prepares the command staff team to focus the seven BOS to battle purpose at Battalion or Brigade. Vertical BCST integrates each BOS (Maneuver, Fire Support, Intelligence, Command and Control, Air Defense, Mobility, Countermobility, Survivability, and Combat Service Support) from the lowest to the highest echelon of command.

Actions: Define the training requirement for individual staff officers, small staff teams, and cross staff coordination at Battalion and Brigade echelon as well as those created vertically across levels of command (e.g., Co/Tm, Bn/TF,Bde and Div) within the various BOS.

Structure BCST to train to STP and BSE proficiency both vertically by BOS and horizontally at Battalion and Brigade echelon.

Immersion in Battle Enables Intensification of Training

Intensification of the BCST training process for RC use requires immersion of the individual or unit in battle situations by the use of new training techniques such as "instant replay" and "fast forward" enabled particularly by simulation. The result is significant compression in the time required to train staffs to standard.

Actions: Develop immersion training techniques applicable to distributed training conducted in the Armory. These include not only immersion in warfighting but also training support to facilitate distributed Context preparation and AAR execution.

Distributed Training to Standard Through Table Training Exercises and Tailoring Training to Competence Level Desired

Tables, replicable vignettes from Battalion or Brigade "days of battle" in TES and their derivative Modules are established as a uniform training technique which permits BCST to standards established by the doctrinal proponent. Combined with thoughtful training material to prepare the warfighting Context, Table exercises permit distributed quality BCST to standard. Then AARs by competent OCs and OEs complete the BCST training.

Actions: Structure the Tables to support the desired AAR--the AAR which trains to desired MOP and MOE at "crawl, walk, run" proficiency levels.

Initiate the process by developing the following BCST training packages: Context, Table or Module as appropriate and AAR for:

Table: Battalion TF Deliberate Defense, Execute

Module: S2, S3, FSO small staff team tactical/technical competence

Table: Fire Support: Co/Bn/Bde echelons

Module: S4 Individual tactical/technical competence

Train by Direct Comparison to Performance to Standard

BCST employing TES trains by exposing unit command and staff (horizontal) or Battlefield Operating System (vertical) staff performance to "a way"--highly competent execution of tactical missions--compared in detail to "your way," execution of the same mission to the same METT-T (Table) by the unit or the BOS-oriented vertical staff team undergoing BCST training.

Actions: Prepare "a way" Context preparation, Table/Module, AAR of a highly competent unit portrayed in TES and enable documentation of "your way" execution of the same warfighting vignette by the unit, small staff team or individual staff officer in training.

Design the training support to permit timely comparison of "your way" to "a way" by designated MOP and MOE.

Assess the adequacy of BCST by Training Effectiveness Analyses.

BCST--a Total Individual and Collective Training Package for Institution and Unit

BCST for RC provides for not only the mission training of the unit or functional BOS staff but also for the institutional or unit training of the individual staff officers and staff teams to prepare them for operational mission readiness in tactical units. Total immersion in battle vignettes enables comprehensive training programs for institutional and unit training programs.

Actions: Apply BCST in the institution such that:

All of the training is conducted in a warfighting environment.

Training support material is designed such that the same package applies for both resident and non-resident regional (USARF) instruction.

Institutional BCST is drawn from the Tables and Modules prepared for individual, small staff team and unit staff training in the unit.

Institutional BCST consists of Tables and Modules reflecting different levels of proficiency.

The basic design of BCST supports the time constraints of reserve training.

All institutional training should employ the same training strategy and training support whether conducted in resident, nonresident regional or nonresident local mode.

This new model for distributed unit staff training should be evaluated in a unit context. Objective BCST proficiency should be assessed at the CTC.

RECOMMENDATIONS

National Guard and DARPA

1. Approve the model and conceptual direction above for execution as the simulation-based BCST training strategy.
2. Develop a DARPA/NGB action program to evaluate the BCST training strategy.

Department of the Army

Assess the applicability of the BCST training strategy for Total Force institutional training.

APPENDIXES TO CHAPTERS 1, 2, 3, AND 6

APPENDIX 1.1

BATTLE COMMAND/STAFF TABLES

APPENDIX 1.1
BATTLE COMMAND/STAFF TABLES[1]

All are concerned about the training of individual soldiers. They, in the last resort, determine the success or failure of the best plan. Yet when we think of individual preparation we normally concern ourselves with the proficiency of the Dragon gunner, the unit mechanic and often the Flatoon Leader. Seldom are the qualifications of the Brigade S-2 or the Battalion S-3 addressed both individually and as an integrated member of a team (Staff) advising the commander. However, on the complex modern battlefield of Airland Operations where synchronization of arms and services is essential, individual staff competence or incompetence leverages the battle to an extraordinary degree. The doctrine states the challenge well:

> ...the only purpose of command and control is to implement the commander's will in pursuit of the unit's objective. The system must be reliable, secure, fast, and durable. It must collect, analyze, and present information rapidly. It must communicate orders, coordinate support, and provide direction to the force in spite of enemy interference, destruction of command posts, or loss and replacement of commanders.
>
> FM 100-5, *Operations*, p. 22

As a result of extended experience at the Combat Training Centers and an excellent system of after action assessments, we know there are systemic deficiencies in command and control:

> In order to be successful, our commanders must improve in synchronizing combat power. The analysis and decision making process must be accelerated so that leaders at all echelons can make the right decisions rapidly. We must be able to project and anticipate so we can seize the initiative.
>
> Battle Command Integration Program
> Combined Arms Center, 09/89, p. 5

1 Frederic J. Brown, *A Simulation-Based Intensified Training Readiness Strategy for the Reserve Component*, IDA Paper P-2611, December 1991, Enclosure B.

Army training doctrine has acknowledged the problem by creating a series of training exercises designed to train commanders and their staffs. These exercises range from the traditional Command Post Exercise (CPX) and Tactical Exercise without Troops (TEWT) to new exercises such as Command Field Exercises (CFX) where operations can be driven by new simulations such as Brigade/Battalion Simulation (BBS) or more commonly for reserve Brigades and Battalions, ARTBASS. Some combination of these exercises are mandated for units in proposed training programs by the National Guard Bureau and FORSCOM. For example, current guidance in FORSCOM/ARNG Regulation 350-2 requires that Battalions/Squadrons train in a CPX annually conducted with authorized simulations; same for Brigades although participation in a CFX conducted at higher echelon counts. The current TRADOC Combined Arms Training Strategy and the National Guard Integrated Training System describe a comprehensive strategy which ties together all the exercises and their enabling training support across echelons. So there is a clear need for command/staff training as well as an elaborate infrastructure of exercises to make it happen.

But what actually happens during the exercises? What specific training occurs in which synchronizing tasks when for the S-3? The answer is that it depends on Mission, Enemy, Troops, Terrain and Time Available (METT-T) and the interest in staff training shown by the immediate commander or chief of staff.

Similar to the STX at small unit level, other than the process of Troop Leading Procedure--the Staff Estimate--the actual training experiences received by the staff are almost wholly dependent on the particular scenario. Training doctrine addresses necessary staff training as a byproduct of the Mission Essential Task List (METL):

> Staff training develops and sustains planning, coordination, and other staff functions relating to wartime mission requirements. Staff training objectives are derived from staff METL. For effective training,staff elements must train together within the same headquarters as well as with staff elements from other echelons within the organization.
>
> FM 25-100, p. 4-4

Staff essential tasks are then defined in the ARTEP-Mission Training Plan of the particular organization undergoing training in the form of Training and Evaluation Outlines (T&EO). For example, a Tank and Mechanized Infantry Battalion Task Force is provided a Mission Training Plan 71-2 which has general T&EO at the Task Force level covering each of the Battlefield Operating Systems and generally describing the collective tasks,

conditions and standards associated with general mission performance. For example, there are two T&EO for Fire Support: Employ Fire Support and Operate Fire Support Section. The Fire Support Section T&EO describes what must have been accomplished by staff planning to ensure effective fire support. In this case, an adequate Fire Support Plan which contains *inter alia*:

- Targets planned on known, likely, and suspected enemy locations; mounted approaches at choke points; dismounted approaches where acquisition is likely; potential enemy overwatch/support-by-fire positions; and easily recognizable terrain features to allow rapid adjustment onto the enemy.
- Smoke planned to obscure enemy observation, screen friendly movement, support breaching operations, and assist disengagements.
- Targets planned to support combat and reconnaissance patrols.
- CAS planned to engage concentrated enemy positions.

Task 7-1-39081, p. 5-MTP 71-2

This is excellent and highly professional detail. Applied by well trained units, leaders and staff members professionally qualified, the T&EO are outstanding. They will guide effectively analytical discussion among and between the S-3, S-2, and Fire Support Officer. Left with less trained units, there is considerable room for local interpretation--issues of "how much is enough" smoke, coverage of suspected locations, or concentrated enemy positions for CAS? These are detail issues but vital professional detail which when understood and shared enables Airland Operations.

How do we train this detail to the reserve staff officer in his or her professional development or those officers when they are grouped into the brigade or battalion staff? At present, aside from the professional support of a trained full time active soldier or reservist present to advise the preparation and execution of training, there really is no explicit training support. Doctrinal guidance is quite explicit that there are no staff drills which apply to this problem:

> Drills provide standardized actions that link soldier and collective tasks at platoon level and below. At company and above, integration of systems and synchronization of systems demand an analysis of METT-T.

FM 25-101, p. 4-8

Perhaps there is an answer in tables for basic command/staff training as there was for small unit training now that there are new technologies available and coming?

The technologies of distributed simulation represented in subsistent, virtual and constructive simulation permitting immersion training in a warfighting context seem absolutely relevant to this training challenge. The potential has been described well in the draft Concept for Advanced Battle Simulation from the Combined Arms Center:

> ABS will allow users at many geographically separate sites to join together in a common exercise, force-on-force, against a common opponent, all using realistic tactics and capabilities in real time. Commanders, staff officers, and individuals on both sides plan, fight, and see the results of the battle or campaign They see the cause and effect of synchronization: the interrelationships of time, space, movement, firepower, air support, intelligence, logistics, and the effectiveness of command and control systems. They can explore the gray areas between audacity and recklessness, paying for errors with the "lives" of their forces. They experience the frustration of human error, failed systems, and over-optimistic planning as well as the satisfaction of well executed missions.
>
> Para. 4A, 30 October 1990

That is the potential of advanced simulation applied to division and above. Potential at that echelon is near reality at battalion. The training technology has been demonstrated by SIMNET in WAREX 03/90 with several battalions in the 1st Infantry Division. However, the training development which could relate the capability to the challenges of command/staff training in the reserves has not been done.

First, several characteristics of distributed virtual simulation (SIMNET) relevant to the command/staff training challenge:

- The simulation is fundamentally different from any other current battle simulation. As virtual simulation, it builds from the bottom up; that is, individual manned tanks, AFV and aircraft fighting absolutely "free play" on a terrain data base. Fire Support and Logistics are represented so the maneuver force faces realistic constraints. This capability is the basic SIMNET breakthrough in distributed virtual simulation--battalions of low cost generally full crew simulators able to fight interactively against a realistic enemy also fighting to win. Now, the number of battlefield objects can expand to include in time virtually all the "drivers" of the battle for all seven battlefield operating systems--dismounted infantry, support vehicles, emitters, jammers--all of the important weapons which trigger staff action.
- As the numbers build, it is necessary to develop ways for the battle to be fought without the necessity of the presence of all the soldiers--particularly essential with the OPFOR. The answer is the Semi-automated Force (SAFOR)--essentially robotic forces or constructive simulation. At present,

this capability exists such that one leader can command effectively in battle one U.S. company or an OPFOR Battalion. This capability should expand in time to one leader per U.S. Battalion or OPFOR Regiment. Successful SAFOR is the key to larger unit operations. It must be applied not only to larger maneuver formations but also to all of the other interactions of the other Battlefield Operating Systems. Several other capabilities or characteristics already proven in SIMNET are particularly relevant to battle command/staff training. They are (in hardware):

- ***Plan View Display (PVD)***--a real time "God-like" view of the battlefield permitting detailed overwatch or playback of the actions of the fighters portrayed on a terrain map similar to the NTC.
- ***Stealth Vehicle***--the ability to move anywhere on the battlefield at any time in the battle without being observed. For example, an observer could place himself in the Company Commander's tank at the precise moment he ordered execution of an engagement area. Or the SAFOR MRB Commander could "beam" himself to the SAFOR unmanned Company Commander's tank and take personal command for the execution of a particularly important phase of mission execution. It is this capability for direct personal intervention "on the ground" to ensure that doctrine, tactics, techniques and procedures are followed appropriate to infinitely variable Mission, Enemy, Troops, Terrain and Time Available (METT-T) that distinguishes SIMNET from other constructive simulations created essentially by algorithm. Application of the high resolution described above for maneuver systems to other BOS will provide the capability for challenging "full up" command/staff training.
- ***Data Logger***--the ability to record then analyze battlefield interactions to provide the detail required for command/staff AARs. Pre-established Measures of Effectiveness (inter and intra BOS) can be compiled rapidly while the command or staff action is still fresh in the mind of the officer or noncommissioned officer. This capability can be quite detailed, which distinguishes SIMNET as virtual simulation from other forms of constructive simulation usually used to generate warfighting for battle command/staff simulations such as ARTBASS or CBS. The detail of potential AAR data is remarkable. The following listing of potential MOE focuses primarily on Maneuver, Fire Support and Command and Control. Other Battlefield Operating System MOP can be developed to support command/staff training.

Potential Measures of Effectiveness
Kills by type by shot--Abrams, Bradley, T72.BMP Total hits at 90 degree aspect ± 45 degrees Blue/Red % ATGM, % Tank Total hits at 180 degree aspect ±45 degrees Blue/Red % ATGM, % Tank Commander locations at critical times--BDE/TF/Company Planned critical times and locations vs actual--major units Commander BDE/TF/CO% time under direct/indirect fire
Effectiveness of direct fire from key locations % targets acquired % targets engaged of those acquired % targets destroyed of those engaged % fratricide
Effectiveness of indirect fire from __ Battery, ___ Mtr Plt % targets engaged of those requested by Commander most/least responsive times, average % targets neutralized of those engaged % targets destroyed of those engaged % time main effort observable by FIST
Effectiveness of suppression at key times in Cmdrs plan Artillery: % of Hhour capability capable of firing, % firing Atk Helo: % of Hhour capability msn ready, % fighting
Effectiveness of Recce % possible targets acquired > 5 km fwd of friendly trace % targets engaged by Fire Support
Effectiveness of Counter Recce % Regt Recon Co neutralized
Terrain Use Average distance between vehicles at key locations % AFV able to engage enemy max effective range at key times in Cmdrs plan
Massing of Combat Power (Blue/Red) % combat power employed at key times in Cmdrs plan (% initial combat power, %remaining-direct/indirect fire)
C2- Troop Leading Procedures Time Div, Bde, Bn, Co orders Reporting: Co to Bn then Bn to Bde.then Bde to Div.
Processing time--mean,mode,average Accuracy of spot reports: reported vs actual Reporting discipline--cueing critical messages Time cmd vehicle able to observe main effort
Synchronization use of Attack Aviation Time ABC enter net to initial engagement Effectiveness of SEAD--% ADA engaged, % neutralized Effectiveness of Atk Avn use--% target engaged, %hit
Effectiveness of CSS Class III % force green/amber/red/black by hour (M1, M2-3, Atk Avn) Class V % force green/amber/red/black by hour (Tank main gun, TOW/25mm,155) Maintenance: time AFV inoperative until BDA present Medical: time casualty until Medics present Approach March: Cl III status

The utility of hardware capabilities (Data Logger) for battle command/staff training seems evident. These MOE examples just scratch the surface of the kinds of detailed information which could be made available routinely for the unit in training potentially at any echelon. This detail available for unit AAR is complemented by the basic nature of the simulation:

- The simulation is unforgiving. Since there are virtually no black boxes solving problems and the simulation builds and aggregates from the individual fighting element up, warfighters and their staffs must coordinate in detail exactly as they would on the battlefield. If integration of combat power is good, the battlefield outcomes reflect that. If it is poor, unfocused, that too is evident. As some BOS are fought in the automated or semi-automated (SAFOR) mode, the software which establishes the battle context (OPORD) and the machine ground rules (Combat Instruction Sets) are readily available and easily changeable to reflect particular doctrine, tactics, techniques and procedures desired by the chain of command.
- All actions are "free play" actions of war fighters and their staffs fighting to win. As a result, the development objective is no scripters for IEW, OPFOR, etc., and fewer to no Observers/Controllers as the analytical data required for chain of command assessments will be readily available in the Measures of Effectiveness (MOE) for each Battlefield Operating System (BOS). This can be observed by Stealth, viewed on the PVD or compiled on the Data Logger as discussed above for use in AARs.
- Overhead should be modest as the major participation required is that of the fighters (command and staff) occupying their TOE positions who are striving to achieve the objectives stated in their OPORD using the doctrine, organization, equipment (embedded in actual equipment through subsistent or virtual simulation when possible) and training of their actual unit. The major training variable is the level of command/staff participation desired by members of the unit at whatever the echelon.
- The distributed nature of the simulation combined with the Stealth capability permit the CAPSTONE commander to transit to the battlefield of virtual objects at will. He may be able to "visit" command groups of subordinate commands--talk to the commander and view that commander's decision graphics. The senior staff officer can visit the higher or lower appropriate staff electronically. As a result of the inherent flexibility of distributed virtual simulation, it appears clearly possible to sustain immersion training in a warfighting unit context for battle command/staff training.
- The most powerful feature of distributed virtual simulation is that for Commanders, key staff officers, ALOs, FISTs, Fighting Vehicle Crews--

> wherever you choose to put man in the loop--there is a visual portrayal of a seamless, virtual battlefield. Commanders can see combat formations moving and make realistic calculations for synchronizing time and space and make on the spot adjustments to battle plans. Artillery and air strikes can be adjusted if the man in the loop is properly positioned to observe. The location, effectiveness and possible enemy countermeasures can be directly observed. The positioning of vital air defense fire units can be checked out "on the ground." The experienced officer can judge if the movement to battle positions by attack helicopters is taking advantage of terrain and if the resulting exchange ratios are valid. **The whole issue of "validity" of battle simulation goes away because professionals can "see" what is happening and instinctively know if it is realistic.**

Thus, summarized, distributed virtual simulation seems to be a technological opportunity to fill gaps in command/staff training. Since objects have to move on the ground in great numbers to cause events to happen--there are no face-saving algorithms--the friction of war can be genuinely present. New capabilities such as sensors or command and control improvements or Terminally Guided Weapons can be integrated and fought.

Given this apparent technical suitability of simulation for rigorous command/staff training, Command/Staff Tables analogous to the small unit tactical tables appear feasible. Conceptually, to achieve the level of resolution of "how to" required to support the T&EO for the unit staff discussed above with fire support, a series of increasingly difficult situations should be presented to the individual and staff in such a way as to cause considered action (coordination) to occur. Then that action is discussed in depth in an AAR. There is precedent for this approach. The Fire Coordination Exercise (FC 71-5, Armor School, January 1985) is a proven command/staff table developed to better train fire support tasks in both institution and unit. Nineteen specific vignettes to fixed METT-T are presented in "what now" situations followed by AAR.

The stimulus for the table can be either a series of vignettes drawn from Desert Storm, Brave Shield, BCTP, NTC, JRTC, or CMTC presented in a "What Now, Commander, or S-3 or Fire Support Officer, etc.?" mode, or the battle vignettes could be drawn from special situations with carefully selected METT-T designed to bring out critical training points. Excellent checklists for staff responsibilities requiring training in tables are included in the ARTEP-MTP T&EO. In addition, FM 71-123 *Tactics, Techniques, and Procedures for Combined Arms Heavy Forces* is a good primer on "how to" by Battlefield Operating System by type unit mission.

Following the tactical tables precedent, battle command/staff tables could consist of three general groupings of exercises. The groups are designed to stimulate training--Lessons Learned--at three well known levels: (1) basic BCTP-type lessons that staffs have to learn again and again pre-mobilization; (2) more advanced lessons that well trained troops can absorb and thereby gain increased competence as they undergo post-mobilization training; and finally, (3) lessons of truly advanced teamwork that when mastered mark only the best of fighting units. See Table 1.1-1 for a brief description of the concept.

BATTLE COMMAND/STAFF TABLES

Basic Coordination Exercises

These are tactical vignettes oriented either to vertical coordination within a BOS or to effective horizontal staff actions required to accomplish various missions. A vertical vignette could be as straightforward as uninterdicted Class III and V resupply in a Brigade hasty attack (drawn from BCTP experience and recreated in virtual simulation) where all the CSS planners and operators from maneuver battalion to division work the issue with other BOS represented by SAFOR. Alternatively, the vignette could be as complex as massing fire support for counterfire during a rapidly changing offensive operation as occurred on Desert Storm. In this case all of the Fire Support Coordinators from battalion to division including Corps Artillery assets could fight with a "canned" METT-T set up in virtual simulation with other BOS in constructive simulation (SAFOR). The canned situation would be designed to bring out the challenges in fire support planning represented in the ARTEP-MTP T&EO in great detail to ensure common professional understanding. Essentially, it could be an upgraded Fire Coordination Exercise (FCX).

A brigade echelon vertical vignette could focus on IEW-Preparation of the Battlefield-orchestration of intelligence collection assets battalion through division then "canned" METT-T execution with all of the Intel capability fighting manned in virtual simulation while other systems fight in SAFOR--essentially an Intelligence Coordination Exercise. Again the METT-T is fixed to ensure that the most productive training required in the ARTEP MTP is achieved. AAR would be conducted as desired probably upon completion of a critical phase or every one to two hours if the table is designed to be "fought" in a UTA 1 (four hours). The AAR would be tied very closely to known CTC shortfalls in achieving ARTEP-MTP standards. The nature of the simulation provides the flexibility such that virtually any training technique desired by the unit could be supported.

Table 1.1-1. Combined Arms Tactical Tables

COMBINED ARMS TACTICAL TABLE

Basic Coordination Table

- Review coordination of basic Staff Procedures vertical by BOS and horizontal by echelon--Bn/Bde
- Full staff--all BOS supported, no degrade to capability
- Minimum OPFOR (SAFOR) to stimulate cmd/staff action
- Crawl, walk, run to standard--more difficult conditions

BATTLE COMMAND/STAFF TABLES

These tables are designed to develop mission-ready battle staffs--Cmd Gp and TOC by requiring demonstrated proficiency to standard in increasingly complex operations. They draw on the SIMNET/CCTT technology, which permits variable resolution in the representation of the BOS. Plan View Display, SAFOR, Stealth Transporter, and Data Logger are all integrated to provide timely AAR feedback to Command and Staff in agreed MOE to predetermined METT-T by BOS.

Staff Actions Table

- Train coordination of priority combined arms collateral operations
- Full unit-all BOS manned, no degrade to capability
- Competent, aggressive OPFOR "fighting to win"
- Stress all BOS, embedded AAR

POTENTIAL

- Opportunity to fight your Contingency mission on that terrain focused by echelon or by BOS.
- Through seamless simulation and variable granularity, fight with your force actually "on the ground"--many objects (tanks, trucks, emitters, etc.). All must receive timely command/ staff direction, just as in battle.
- Semi automated Forces (SAFOR) permit major units to be fought with minimum personnel. Key battle decisions at subordinate echelons are human. Distributed simulation is supportive of distributed RCunits or coalition allies.
- Technology developments should permit hybrid simulation where a CFX could be conducted with some fighting from actual vehicles while others fight from simulators and others are in a CPX or classroom environment.

Command/Staff Reaction Tables

- Intense,demanding tactical situations requiring quick, innovative responses
- Degraded mode by BOS-key personnel casualties, logistic shortages
- OPFOR(SAFOR) advantage, challenging missions
- Stress joint and combined coordination under challenging conditions

Horizontal vignettes would focus on training the full staff at the selected echelon at battalion or brigade in the Basic Coordination Exercises. The METT-T of a particular mission "fought" on Desert Storm or at CTC could be recreated as of H Hour with full battalion command and control distributed as described in doctrinal publications. Then the battle begins with brigade and company and below represented by SAFOR. The simulation technology would permit "refight" of that mission followed by detailed AAR incorporating the MOE as desired by the battalion commander. Now the focus would be on coordination of command/staff to the ARTEP-MTP T&EO. Then should the chain of command desire, another warfight could be conducted perhaps executing another course of action but again reinitialized to the same METT-T as the preceding mission. In all cases, the overhead would be reduced significantly by fighting brigade and above and company and below in SAFOR.

If desired, the technology would permit development of a "standard" battalion or brigade operation with METT-T laid out by the Combined Arms Center and well-documented ORLL. This operation, analogous to the school solution "par" for the tactical tables, could be made available to newly assigned Brigade Commanders on a distributed basis such that they could "calibrate" their command and staff procedures. Competition could also be encouraged to "beat the par." Once the TRADOC or Major Command METT-T is initialized, the brigade could vary the manned/SAFOR mix as desired.

Staff Actions Exercises

This group of exercises would be considerably more challenging than the basic in that more complex collateral operations would be fought against a more aggressive and capable enemy and the full flow of operations would be permitted to develop. That is, the trigger for command/staff action would not be "canned" vignettes but rather a free flowing campaign or battle, which, given the general correlation of forces, could be "won" by the OPFOR if the friendly force (battalion or brigade) is not fought well. The AAR process using detailed MOE developed for the Basic Coordination Exercises would be available but used to reinforce the chain of command as it trains itself not through any intermediaries such as O/Cs. At this level, missions would be complex involving multiple collateral operations. An example could be brigade delay against division size forces with corps priority for fire support and mid-battle OPCON of an Allied force. All BOS would be fully mission ready at the onset of operations. At the battalion echelon a comparable mission could be battalion hasty defense against a multiple brigade-size force with division priority

of fire support. Such a mission would stretch the command-staff capability to focus combat power.

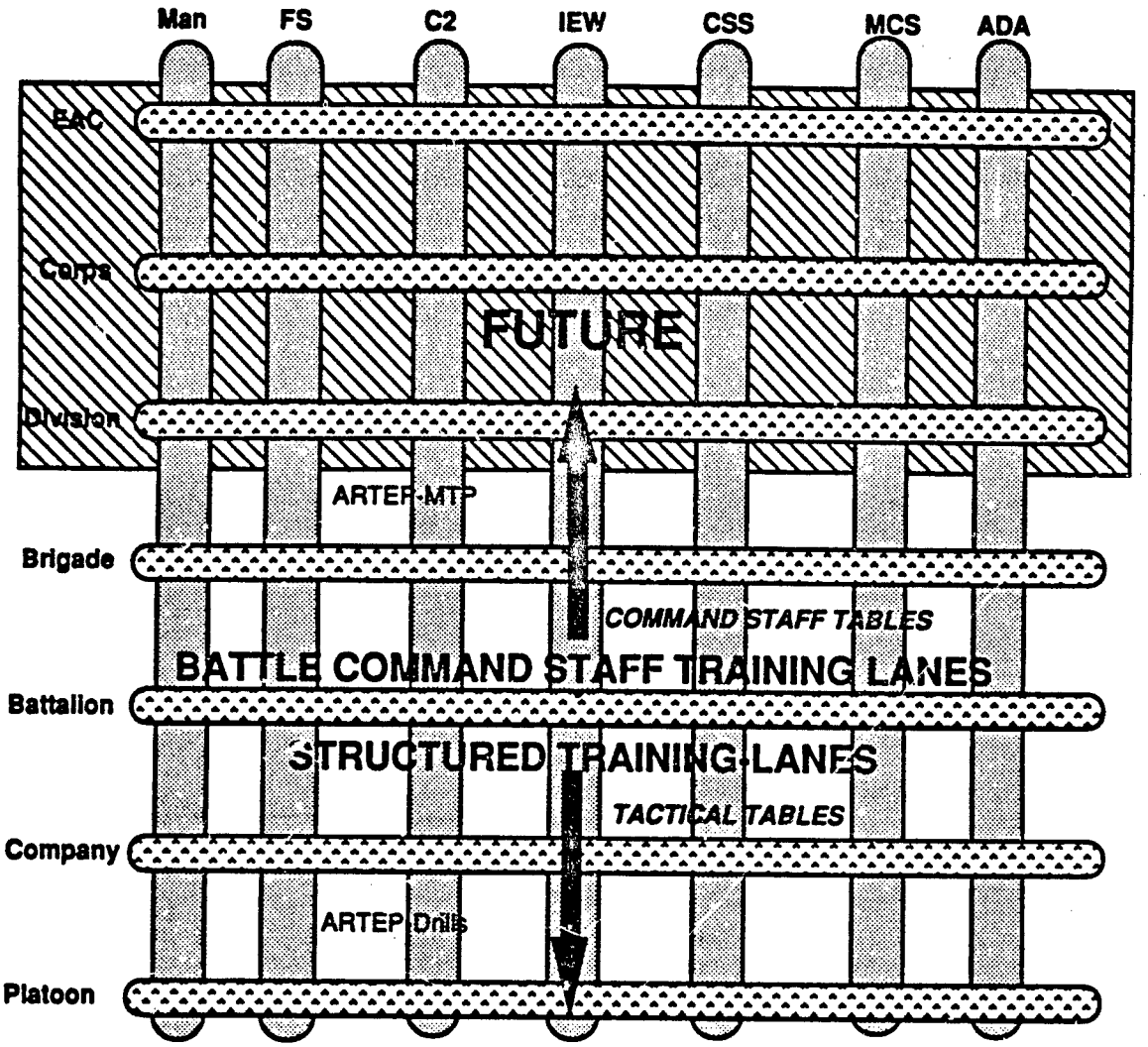
Command/Staff Reaction Exercises

Reaction exercises would be extraordinarily challenging, requiring a level of teamwork and capability in focusing combat power well above the average. These are the lessons of truly advanced teamwork which can be represented only in distributed simulation technology. Each battle could be complex involving major OPFOR forces with reduced friendly capability and the initiative resting with the OPFOR. Joint and combined forces would be an integral part of all contingency scenarios being "fought." An example could be a reduced capability brigade hasty defense against a division with enemy fixed and rotary wing superiority and a severely constrained friendly logistic capability. Friendly personnel losses during the operation would include one or more commanders in the brigade. At the battalion echelon, a delay against larger OPFOR forces with limitations in selected friendly BOS could be a suitable Reaction Exercise. Other similar scenarios would stress BOS coordination within the division/brigade/battalion, dependent upon the training requirements of the chain of command. All three of these sets of tables should be capable of execution in any combination of virtual and constructive simulation desired by the chain of command. The training and technology should permit a broad range of personnel requirements dependent on the training audience. See Table 1.1-2, Intensive Training Matrix.

These examples hopefully reflect the significant potential for remarkable improvements in AirLand Operations command/staff training permitted by distributed simulation for both unit and institutional training site--Battle Command/Staff Tables. Detailed development of this training is beyond the scope of this effort. It is included to indicate that the methodology applied to small unit and leader training appears equally applicable to command/staff training. The training support recommended, particularly the Commander-Staff Trainer, should enable this necessary training.

Table 1.1-2. Reserve Forces Intensive Training Matrix

Fighting vertically by BOS or horizontally by echelon with mix of personnel and automated participation as desired by chain of cmd



Training Strategy: Distributed collective training to pre determined METT-T by echelon or by Battlefield Operating System, enabled in the Armory or Reserve Center by distributed virtual simulation. Very intense immersion training package provided to the chain of command by doctrinally correct Tactical Tables and Battle Command/Staff Tables combined with embedded AAR support. Chain of command determines degree of automated support, i.e., if training Fire Support, all from that BOS present, other BOS could be constructive.

Echelon

BOS

APPENDIX 1.2

VERTICAL BCST--FIRE SUPPORT

APPENDIX 1.2
VERTICAL BCST--FIRE SUPPORT

GENERAL PRINCIPLES

Battle Command Staff Training develops individual staff officers (such as the S4 or S2); staff teams (such as S3, S2, and FSO) and collective staff (Battle Staff Integration) proficiency. To date, most of the training focus has been placed on horizontal teaming; that is, the creation of a high performance command/staff team functioning at each command echelon. For most citizen soldiers, this has meant Battalion and Brigade Staff training although the methodology is applicable for Divisions or Support Groups. Battalion and Brigade command and staff competence is a precondition to unit success in warfighting. However, horizontal competence is necessary but not sufficient to successful execution of current fighting doctrine-AirLand Battle. The imperatives for successful execution of this doctrine, particularly synchronization, mandate vertical integration of each of the seven Battlefield Operating Systems (BOS) at each echelon of command of maneuver units. For a graphical representation of these vertical and horizontal interactions, see Figure 1, Chapter 1.

Successful execution of every combat mission requires the successful application of varying combinations of Maneuver; Fire Support; Intelligence; Mobility, Countermobility and Survivability; Air Defense; Combat Service Support; and Command and Control. Each of these BOS is a function which must be coordinated vertically up the chain of command to achieve its battlefield effects. That is, it gains its effectiveness from synergistic interactions within the framework of the BOS from the smallest battlefield entity--for fire support, the Company Fire Support team (FIST)--to the highest supporting echelon [e.g., the Corps Army Tactical Missile System (ATACMS) or the flight of four F-16s providing Close Air Support (CAS)]. The fire support "whole" is much greater than the sum of its parts. The fire support "family" is the vibrant "brain and muscle" interacting at every echelon from gun section to Corps and numbered Air Force or Naval Surface Group to support the ground commander. Each BOS has a similar functional vertical framework or vertical "team." Vertical BCST addresses the training of each of these BOS "teams" in

support of the mission and tactical intent of the ground force commanders at each echelon of command.

The explicit requirement for structured vertical BCST is new. It has developed both from doctrinal statement (FM 100-5 *Operations*) and from practical need in fighting and winning jointly and with allies in the Persian Gulf and in the various Combat Training Centers. Clearly complex new Tactics, Techniques, and Procedures such as Counterfire or Joint Air Attack (JAAT) involve split second interactions within and between various BOS. Successful counterfire mandates extremely rapid acquisition, assessment, allocation of assets and delivery of effective fires. These complex tasks require complex multiechelon coordination. They must be practiced regularly.[1] Some structured training support is required to enable, in fact encourage, regular practice.

There is a second equally important reason to develop vertical teaming or bonding. The accelerated tempo of modern battle mandates new tasks, conditions and standards for unit staff performance. Newly enabled collateral operations such as deep attack immediate Joint Suppression of Enemy Air Defense (JSEAD) require new levels of vertical and horizontal coordination. Maintaining, then drawing upon a continuing flow of information up and down the vertical BOS "stovepipes" is a precondition to agility in modern battle. Yet this vital vertical flow of functional information is seldom represented or trained in staff training of maneuver units.[2] Nor does the process-orientation of normal school-based staff training encourage use of vertical information flows. For instructional purposes, to ensure that students understand the staff processes, past institutional staff training has focused on execution of sequential staff processes such as Intelligence Preparation of the Battlefield (IPB) or wargaming of courses of action all focused at a specific echelon. These are portrayed as separate and distinct requirements in a prescribed staffing process and are evaluated in detail in C nbat Training Centers as practiced in thoughtfully structured

1 All understand that the tank crew or the Dragon gunner must train to standard frequently. We have been less prepared to accept that the S2 or S3 or FSO have equally complex cognitive sequential tasks to perform to standard individually and in concert with each other on the same staff as in the case of counterfire. Even less have we recognized the need for the Bn, Bde and Div Fire Support Element to practice as a functioning vertical "team" to achieve the split second coordination required to win in modern warfighting.

2 In the pace of MUTA to MUTA activity, it is really difficult to assemble the entire unit staff to train as a staff "team" much less ensure that the appropriate staff and functional personnel from one and two echelons higher or lower will be available for vertical training. It is even more difficult to represent this in institutional training when the required expertise crosses functional jurisdictions.

sequential missions.[3] The mission sequence is Plan, Prepare and Execute then pause for a unit-oriented (horizontal) AAR.

In combat, there are seldom sequential missions. A more typical situation is multiple, simultaneous activities. Commanders and staffs at all echelons are immersed continuously in *Monitoring* ongoing operations, *Directing* new activities and *Planning* future operations. Communications nets hum with necessary information passed vertically and horizontally. Horizontal staff processes never occur in a vacuum. At each echelon there is horizontal coordination within the organization and vertical coordination up and down the seven BOS continuously. No unit staff planning starts from scratch at any echelon. Rather a mission is a new requirement placed on a continuously functioning process. So to reflect the tempo and challenges as well as the benefits of continuing staff coordination in modern combat, BCST should include both horizontal and vertical training.

Horizontal BCST has been defined in detail. What should be the design of vertical BCST? First and foremost, the general principles and logic of horizontal BCST as it is structured to support distributed reserve training seem to apply.

a. The key to BCST training development is highly effective After Action Reviews (AARs) which train to required individual and staff team competencies. BCST pretrain modules are required to prepare the unit trainers, OCs and OEs to conduct distributed quality BCST to standard. **Design the training to support the AAR such that OCs, OEs, or unit trainers can conduct distributed training to standard.**

b. **BCST Tables must be developed** to enable distributed training to prescribed individual and team (staff) competency as defined by performance on MOP/MOE.

c. Individualized (self-paced) training programs are required to develop competency in individual command and staff positions and small staff teams by Battlefield Operating System to ensure effective, efficient BCST. **Individual staff training programs complementary to the Tables and Modules and supportive of the AAR are required.**

3 An excellent description of this rather elaborate process is presented in CGSC ST 100-9, *Techniques and Procedures for Tactical Decision Making*, July 1991. See Chapter 7, Intelligence Preparation of the Battlefield. Frustration with institutional focus on staff processes was reflected recently in an ARI survey of 48 Battalion Commanders experienced in Operations Just Cause, Desert Storm, or the normal CTC process. Lussier, James W., and Douglas J. Litavec, *Battalion Commanders Survey: Tactical Commanders Development Course Feedback*, ARI-Leavenworth, 1992.

It would seem that the only major changes in moving from horizontal to vertical BCST would be in the need to form the vertical teams for training. Individual training at each echelon could include more vertical BOS content to ensure that the BOS staff officer at each horizontal echelon knows the responsibilities of his or her senior or subordinate in that particular BOS. It is reasonable to expect that the staff officer responsible to coordinate a particular BOS would be trained in the capabilities and limitations of that BOS up to two echelons higher. That content could be routinely incorporated in instructional training support material.

Vertical small team building is more difficult.[4] General tasks are very similar within a BOS as one ascends the BOS ladder. The major difference is that higher echelons have additional alternatives available to achieve the battlefield purpose of the appropriate BOS function. The training challenge is to create a training environment such that the key individuals can interact as a team vertically up and down two or three echelons sufficiently often for small team cohesion to develop. This is a challenge for distributed training once the membership and shared task proficiencies for the vertical teams are developed.

The third aspect of vertical team building involves all within the BOS from the smallest tactically significant entity to the highest entity normally at Corps echelon. There is a useful general model readily available in the work of Joseph Olmstead. He developed the team-building requirements for application to horizontal BCST in formulating Battle Staff Integration (BSI). The horizontal perspective appears fully applicable to vertical. Enclosure 1 modifies the Olmstead model for vertical BCST addressing the development of Battle Staff Effectiveness. Individual and small team skills will come as Tables and Modules focus on Staff Task Proficiency. A more difficult development challenge is creating the integration required to achieve satisfactory BOS organizational competence in sensing, communicating information, decision making, stabilizing, communicating implementation, coping actions and feedback *all vertically*.[5]

4 Note that we are discussing the primary staff officers or their assistants at each echelon. Clearly the ADA or Engineer Platoon Leader supporting the Battalion or the CEWI Company Commander supporting the Brigade bring special expertise to advise the battalion or brigade on their capabilities as well as command their BOS-oriented unit. But there is specific knowledge of that BOS which must be possessed by the appropriate primary staff officer (S2, S3, etc.) if the BOS is to be properly represented in the staff planning process at battalion and brigade. It is that expertise which we are discussing.

5 Olmstead, Joseph, *Battle Staff Integration*, IDA Paper P-2650, February 1992, Appendix B, pp. B-3 to B-9. Note that personnel turbulence or turnover can be as disruptive of effective vertical staff actions (BSI) as we know it is of the horizontal.

Proper structuring of basic vertical BCST to highlight development of organizational competence should address these new training challenges. For example, Organizational Effectiveness expertise is as appropriate in training organizational competence for vertical BCST as it is for horizontal. In addition, vertical task linkages by BOS already established in the formulation of Combined Arms Battle Tasks can be extended vertically--above Battalion to Brigade and Division--with appropriate standards so that the horizontal focus of both training and evaluation of current BCST can be expanded to include vertical interactions. Then the existing training support structure of OCs and OEs should provide the required vertical emphasis. Both requirement and solution need to be validated by Training Effectiveness Analyses.

That is the general concept for vertical BCST. Clearly it needs to be reviewed closely for there are significant resource implications in enabling this training. Thoughtful analysis requires more rigorous description. To provide additional detail, I have selected one BOS, Fire Support, for expanded conceptual development and recommended Training Effectiveness Analysis.[6] Any BOS would suffice to validate or refute the general methodology. However, integration of direct and indirect fires is an important and persistent problem in the maneuver force. A vertical training exercise--the Fire Coordination Exercise--employing Tactical Engagement Simulation (TES) MILES has been used by the Armor Force, so there is a basis for direct comparison. As Fire Support proponent, Fort Sill has thought extensively about task analysis of the fire support process in designing AFATADS, the fire support complement to the Maneuver Control System. Lastly, in consideration of the very close links between Maneuver and Fire support, existing TES virtual simulation (SIMNET) represents Fire Support better than most of the other BOS.

To develop Fire Support BCST, I shall use the same organization as that in the overall BCST Paper: The AAR, BCST Tables, Preparation to Conduct the Table Training, Supporting Individual and Small Group Training and Applications to Institutional Training. Comments generally will be based on a vertical rather than horizontal view of BCST in order to distinguish differences.

6 The second should be Intelligence in consideration of its tie to Fire Support and Guard training needs.

THE AAR

Design of the AAR

AAR of vertical BCST should be very similar to horizontal. The same general principles of personal participation apply. Challenges arise due to the multiechelon nature of the BOS. This will influence each aspect of the AAR. For example, one simple statement of the commander's intent is not sufficient. When the operation in question involves Battalion, Brigade, and Division, all three commander's intents regarding both the overall unit mission or missions and intents for the employment of the specific BOS in discussion are relevant to AAR discussion. This aspect is particularly important in joint and combined operations when different priorities at the strategic or operational echelons may have significant impact on employment of the particular BOS at the tactical echelon. For example, Air Component Commander priorities (Desert Storm Air Tasking Order [ATO]) could severely impact the availability and nature of air support considered as an important part of Fire Support. Inability to share selected tactical intelligence with certain allies could have major impact on Intelligence effectiveness. Similarly, the OPFOR should present multiechelon discussion since the relative priorities may differ from echelon to echelon within the OPFOR. It would seem at a minimum that the AAR would have to be segmented by echelon. That raises a more substantial problem: time compression or acceleration.

Each echelon of command allocates its assets on a different time schedule. Real time for Field Artillery fire planning at Division would be insufficient time for representation of the air support planning cycle. Yet all of the vertical BOS planning and execution activities need to have been completed and analyzed individually and interactively for AAR purposes at roughly the same time. In vertical BCST a major decision would seem to be to establish the primary echelon to be trained, then pace the simulation tempo of the warfight to be real time for that echelon. For example, if the primary focus is Fire Support at Brigade, air support planning would be accomplished on a compressed time schedule. Dependent on the BCST training objective--priority of echelon and particular BOS--Tables and AARs may run on different clock rates. Simulation must be designed with sufficient flexibility to accommodate this. The determinant should be what is best to ensure that the desired training occurs to standard with the target training audience.

Task Checklist for AAR Design

There appear to be voluminous task lists for the functional areas. There is explicit proponent responsibility within TRADOC and the systems acquisition process requires explicit functional definitions. For example, in fire support there is an extensive task list in the "Red Book" of fire support functions prepared for AFATDS development.[7] The Fire Support Command, Control, and Coordination System is divided into 5 operational categories, then 27 functions, then 420 tasks and subtasks. Furthermore, the Field Artillery School states that

> By definition, a "functional definition" describes activities without regard to the organizational structure that supports them. The underlying assumption is that an activity, such as fire support planning, requires the same actions whether performed at battalion or brigade or division.[8]

This facilitates the vertical BCST task selection problem considerably. When the tasks expressed in the ARTEP-MTP for the supported maneuver organizations (Company, Battalion, Brigade, Division and Corps) are added, there is a broad array. The challenge then is one of narrowing tasks to be trained in the AAR to those required by the organization, or Capstone contingency troop list.

Now the problem becomes more difficult. Vertical BCST has a much wider range of choice than does horizontal. Battalion BCST can vary all of the elements of METT-T but practical choice is restricted to one of five or so missions, then selection of appropriate friendly and OPFOR support. Choice in vertical BCST is much broader Is the primary focus to be fire support at Company, Battalion or Brigade? Which additional echelons of "fire supporters" are necessary? Is the training focused on fire planning or fire execution or both? Offense or Defense? Which fire support means are to be trained: Mortar, Field Artillery, Air Support, Naval Gunfire, Attack Helicopter, Battlefield Obscuration, or Target Acquisition? Is the training model a single maneuver mission, therefore Plan, Prepare, and Execute as in the CTC model or rather multiple, simultaneous missions where the model should be Monitor, Plan, and Direct as advocated in the draft FM 101-5? Then after these design considerations have been considered what shall be the specific METT-T of the Fire Support Table?

A useful general methodology has been proposed by the Artillery School:

7 USAFAS DCD, *Fire Support Functional Definition*, Version II, Volume 1, May 10, 1991.

8 Ibid.,p. 6.

Decide-Detect-Deliver

> In the decide phase, targets are identified for engagement. The FSO, S2, and S3 decide what targets to look for, where the targets can be found on the battlefield, who can locate those targets, and how the targets should be attacked. Together, they determine the assets to be allocated and additional assets available and identify channels needed to provide information on a real-time basis.
>
> The detect phase is designed to execute the target acquisition conducted in the decide phase. In this phase, target acquisition assets are tasked to find specific targets. Characteristics and signatures of the relevant targets are determined and then compared to potential attack means to establish specific sensor requirements. Sensors are focused to detect the functions.
>
> The deliver phase involves selecting the right attack system to attack specific Threat functions, meeting attack guidance, and performing postattack assessment (if required). This includes both lethal and nonlethal attack systems.[9]

Note that the methodology can be used both horizontally and vertically. Tasks desired to be trained in the AAR could be fitted logically into this framework for Fire Support BCST.

The major problem of task selection appears to be narrowing of a very broad task list consistent with the training needs of the chain of command. For purposes of initial vertical BCST development, it seems preferable to draw on the instructional experience of the Armor School which has trained fire support in a Fire Coordination Exercise (FCX) using subcaliber devices and TES (MILES) since 1984.[10] The Knox FCX trains Company Team Movement to Contact/Hasty Attack, Company Team Defense, Battalion Task Force Deliberate Attack, and Battalion Task Force Defense. The FCX task list and associated AAR could be expanded as required. The advantage is starting from a known and accepted base.

There is one other aspect of task selection for the AAR. That is the grouping of the tasks reflecting both the complexity of the tasks and the conditions under which they must be performed. Progression from the less to more complex tasks is a proven training technique. Army training doctrine calls for training to progress from "crawl" to "walk" to "run." This seems particularly applicable as vertical BCST crosses component jurisdictions. Future contingency deployment task organizations seem certain to include all

9 Department of the Army, TC 6-71, *Fire Support Handbook for the Maneuver Commander*, November 1988, p. 41. Various planning matrices are proposed to support the methodology. Examples are: High Pay-off Target Matrix, Attack Guidance Matrix, and Fire Support Execution Matrix.

10 USAARMS, FC 71-5, *Fire Coordination Exercise*, January 1985.

components--Active, Guard, and Army Reserve within most Corps "slices." There should be a "core list" of basic tasks which must be trained to standard regardless of component at each vertical echelon to enable the BOS. These could be considered "crawl" tasks.

Then there are tasks associated with drawing together BOS capabilities across Services. Proficiency in aggregating joint BOS capabilities is increasingly important. For Fire Support, most collateral operations are joint--air and naval support are integral to fire support planning. "Walk" tasks could be those associated with joint operations.

Lastly, it seems clear that U.S. Forces will rarely deploy without Allies. Regional contingency operations all are foreseen as combined operations with allies, either traditional or ad hoc allies. Vertical BCST at the "run" level could focus on application of the appropriate BOS in combined operations. In sum, in consideration of widely varying conditions which can govern vertical BCST warfighting--reserves, joint and combined--it may be prudent to group tasks and training exercises responsive to these differences.

MOP/MOE Development

This does not appear to be a problem for the BOS other than Maneuver. Maneuver unit MOP were addressed in horizontal BCST. Fire Support and to lesser degree the other BOS, have explicit performance requirements built into the ARTEP/MTP. Either the fire is on target when required or it is not. The functional capability performs its assigned task to standard or it does not. TES (both virtual and constructive simulation) permit high resolution analysis of battlefield actions. Evaluation can be heavily performance-based. This performance-basing can extend to individual and small teams by direct comparison between "a way" the vertical table is executed in a doctrinally correct, successful manner and "your way" of execution. OE assessment of organizational competence is valid vertically as well as horizontally once the relevant BOS "teams " are identified.

To get started on Fire Support, use MOP/MOE developed by the Armor School for the FCX with additions which may be desired by the Proponent for development purposes.

AAR Training Support

Use the same training support required for Battalion BCST both at Fort Knox and as exported to the Mobile SIMNETs. Additional IFOR (Intelligent Forces) capability may be required to represent Battlefield Obscuration and Target Acquisition. Datalogger modification may be required to represent higher echelon (Brigade and Division) fire support execution.

Objective AAR

Initially design the Fire Support BCST AAR to duplicate the current Armor School AAR for the Fire Coordination Exercise. Then with experience, expand to Brigade and incorporate additional fire support means such as laser-guidance and Close Air Support which were not possible with TES (MILES) but which are enabled by TES (SIMNET).

BCST TABLES

Define Table Training Scenarios

The basic rationale for Tables has been discussed in the context of horizontal small unit training and in horizontal BCST. Existing AFV Combat Tables have been extended to Combined Arms Tactical Tables (Company Team and Battalion Task Force). The training strategy and training development logic of structured exercises with "frozen" initial METT-T permitting "A Way"--execution by a highly competent unit--compared with "Your Way"--execution by the unit in training--all conducted by immersion in virtual or constructive simulation is applicable to vertical BCST. The challenge is to develop the structured training exercises (Tables) which will cause the desired training to occur in highly training-effective AARs.

The rationale supporting three levels of complexity of Tables in horizontal BCST applies equally to vertical BCST. Coordination, Tactical Actions, and Reaction Tables are proposed for all of the BOS other than Maneuver which is incorporated automatically in the horizontal and other vertical BCST Tables.[11]

The Coordination Tables would review common understanding of basic vertical BOS responsibilities. To facilitate learning, full BOS capability would be represented with minimum OPFOR and a very deliberate sequential phasing of requirements. Basic Army capabilities would be used. Essentially, these are the "crawl" "Dick and Jane" exercises requiring proficient use of "bread and butter" BOS capabilities.

Tactical Actions Tables are more challenging. They move into more complex multi-BOS collateral operations usually involving detailed joint coordination. While there is no degrade to friendly BOS capability at least initially, the OPFOR would be highly competent

[11] While the focus here is on the development of Tables, recall that the purpose of the Table is to support the battle command/staff training occurring primarily in the AAR. The Table structure proposed should support AAR training across the broad range of tasks included in vertical extension of the BOSs.

and very aggressive, "fighting to win." There would be a "full court press" on the BOS at every echelon simultaneously.

The most difficult exercises are the Reaction Tables; they present intense, demanding situations requiring timely BOS employment in multi-BOS collateral operations usually in contingency operations supporting and in turn being supported by allies of greatly varying capabilities. Some BOS capabilities are degraded; the OPFOR is capable and aggressive. These are the "PhD" level Tables. For a graphical representation of these tables, see Enclosure 2. At Enclosure 3, broad guidance for the design of Tactical Tables-Fire Support is suggested. At each of the levels (Coordination, Tactical Actions, and Reaction) there is a different fire support requirement presented. To further clarify the intent, proposed vertical Tables are levered from horizontal BCST Tables proposed earlier in the discussion of horizontal BCST. At the Coordination level of complexity for vertical fire support BCST, horizontal BCST Table 5: Planning a Bn Task Force Deliberate Defense is drawn upon to provide the basic tactical situation. The result is Coordination Table: Fire Support Planning. See Tab a to Enclosure 3. Horizontal Table 7 provides the tactical backdrop for another Coordination Table: Fire Support Execution. Tab a. The same application of proposed horizontal BCST suits Tactical Actions Tables. At Tab b to Enclosure 3 is a possible Tactical Action Table: Fire Support (Planning and Execution). Other direct applications of horizontal BCST Tables seem certain. This should reduce the manpower and fund cost of creating the necessary documentation for the vertical BCST.

Tables for the Proof of Principle

Creation of the Fire Coordination Exercise prescribed in TC 71-5 as a prototype Fire Support BCST Table provides an initial vertical table for training development at minimum cost.

Setting the Context

Provided by the Armor School for the existing fire support exercise. Context-setting becomes a complex problem as vertical BCST extends across all the BOS and within the BOS from individual tactical entity (GSR or ADA Platoon) to Echelons Above Corps as seems likely in the Louisiana Maneuvers joint exercises. Requirements should be similar to those recommended for horizontal BCST. Initially it may be useful to develop one all-purpose Corps echelon war fighting scenario which serves as the backdrop for all vertical BCST, at least at the Coordination level of complexity. An updated TRADOC

Common Teaching Scenario could be translated to virtual and constructive simulation to serve as the BCST developmental baseline.

Table Training Support

Requirements to be provided by the Armor School for FCX conversion. Further requirements would depend on the development path selected.

PREPARATION TO CONDUCT THE TABLE TRAINING

Command Pretrain

Command pretrain will be a substantial problem but not for obvious reasons. The challenge is not to train the unit chain of command in vertical BOS themselves. Rather it is to convince the various tactical unit commanders that vertical BOS competency of their staffs at all echelons is sufficiently important to successful warfighting that the appropriate staff officers and noncommissioned officers are made available for vertical training at times convenient to assembling the vertical BOS personnel--physically or by Wide Area Network. Vertical BCST may not seem particularly important to horizontal unit commanders who have numerous competing peacetime requirements for their staffs. *Inter alia*, the competing requirement for horizontal BCST itself competes directly for staff time too.

The problem is more than releasing the personnel for BOS training, however begrudging. It is also a challenge of creating a vertical BOS group identity. The planners and executers of a particular BOS in a contingency troop list need to bond as a team.[12] Several types of support are required for that. They need the command support mentioned above. In addition they need appropriate training support--the vertical Tables supporting training-effective AARs. They need the technical support which provides interesting, effective, and efficient distributed immersion training. That is the immediate training and technical development challenge of BCST accepted by DARPA and NGB, in fact the Total Force. The longer term answer rests with the TRADOC Proponent who is responsible to the Army leadership for the doctrine, organization, equipment, training, and personnel of the particular BOS. The responsible proponent must be an articulate and powerful spokesman of the BOS if vertical BCST is to occur in busy units. Vertical BCST Tables

12 This is, of course, not a new problem. FORSCOM initiated Capstone (contingency organizational structure) over a decade ago to encourage vertical staff planning.

and Modules provide an unprecedented opportunity for Proponents to support and ensure training and evaluation to standard.

Resident Training Detachment (RTD)/Readiness Groups (RG), OC and OE Pretrain

This too should be a major concern of the Proponent. RTD and OC personnel are generally trained and assigned by BOS reflecting the BOS orientation of doctrine, personnel assignment and increasingly the evaluation process at the Combat Training Centers. While the overall charge to RTD and OC is to improve unit proficiency, day-to-day execution tends to be by BOS. As the Proponent prepares individuals for RTD or OC duty, they can provide BOS training in greater depth appropriate to the AAR requirements of the vertical BCST Tables. OE prepared for support of horizontal BCST should require no unusual preparation for vertical BCST, although new vertical skills will have to be trained.

SUPPORTING INDIVIDUAL AND SMALL GROUP TRAINING

Individual Staff Officer

Vertical preparation of staff officers is a substantial problem across the Total Force. Lack of formal institutional training before or at the Officers Advanced Course combines with significant staff officer turbulence and turnover to create the problem at Battalion echelon.[13] Vertical BCST should specifically address this problem. First and foremost, the vertical Table and derivative Modules establish explicit, replicable tasks, conditions and standards for training and evaluation of staff officer performance in appropriate BOS. In addition, as the Proponent develops the AAR, the vertical Table and Modules to include "A Way" and the context material particularly at Battalion and Brigade echelons, all of the training support material necessary for staff officer training has been created. Furthermore, the training can be packaged to be single echelon or preferably multiechelon so that the staff officer is trained in the capabilities and limitations of BOS staff responsibilities one or two echelons higher and lower. Whether staff officer training is to be conducted in the institution (resident or exported) or in the unit, the Module media can be modified readily.

[13] This problem has been documented well in an ARI Report. Thompson, Thomas J., George D. Thompson, Robert J. Pleban, and Patrick J. Valentine, *Battle Staff Training and Synchronization in Light Infantry Battalions and Task Forces*, ARI, Ft. Benning, September 1991.

Initially, TV or CD-ROM based training Modules can be extracted from the vertical table. Later, distributed virtual simulation should be available in the Armory if not home.

Staff Team

As discussed above, the training challenge here is to create a training environment such that the key individuals can interact as a team vertically across two or three echelons sufficiently often for small team cohesion to develop. This seems much more a problem in effective distributed training to standard than it is one of designing an appropriate training strategy and training support. The conceptual training response is to group the team tasks into vertical team-building exercises based on table vignettes. The exercises can be structured to require each staff officer to coordinate with his or her BOS peer, higher or lower, all with appropriate AAR to support effective training. Immersion in the vertical tables with the AAR of "A Way" highly competent similar vertical staff teams have solved the BOS coordination problems and should cause effective and efficient training to occur.

But the training package itself is not the most substantial problem. How to cause this to happen routinely when the Battalion S4 is in one town, the Brigade S4 and the Brigade Headquarters are located 400 miles from Battalion, and the Division G4 and DISCOM Commanders are in an adjacent state? The answer here, as in individual training, is in distributed simulation sufficiently low cost to permit individual staff officer use at home comparable to cable television today. That is a substantial challenge in vertical BCST development.

Enclosures

1 "Vertical" Synchronization

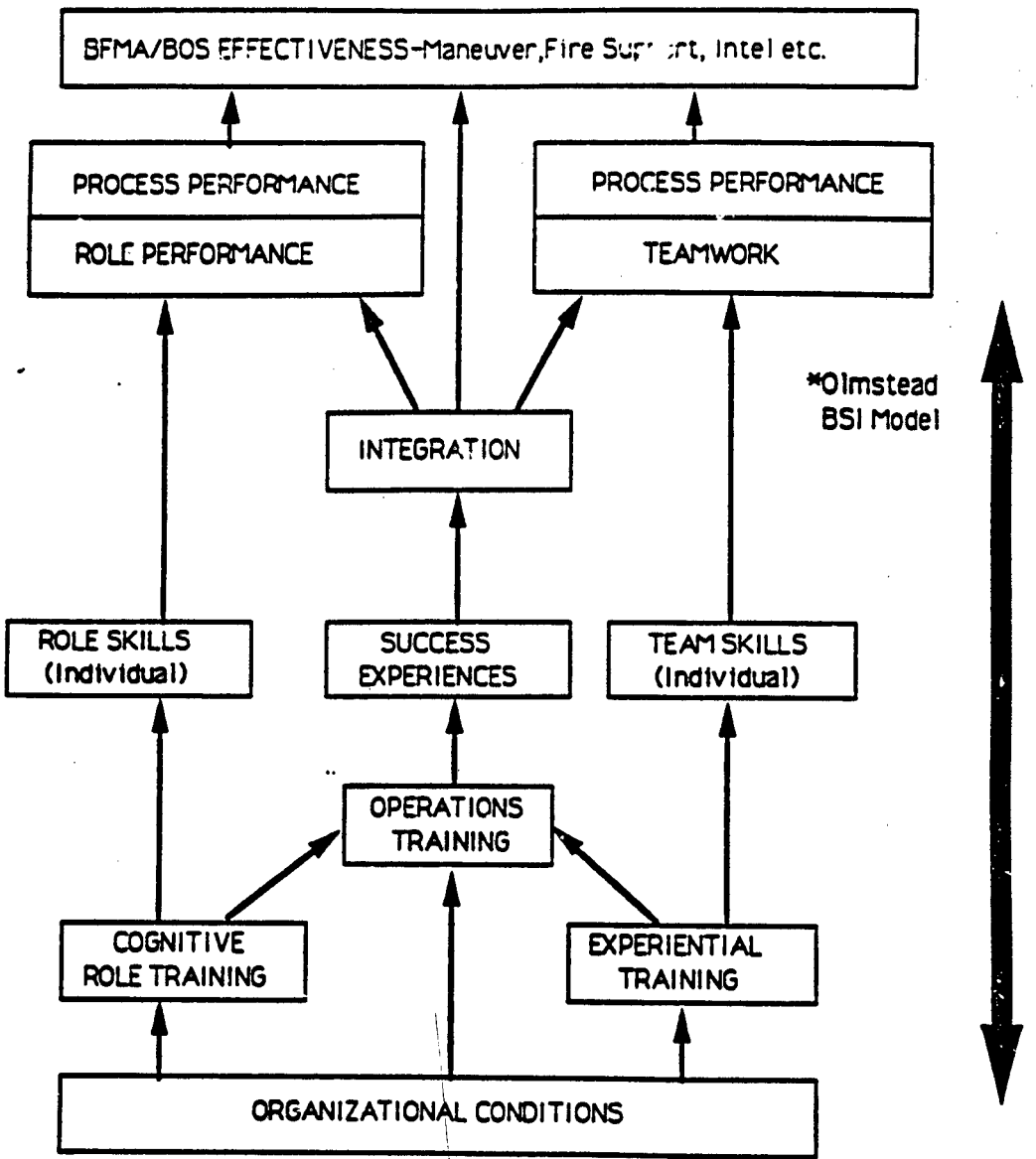
2 "Vertical" Tables

3 Tactical Tables-Fire Support

Tab a Creating BCST Tables (Horizontal and Vertical-Defense)

Tab b Creating BCST Tables (Horizontal and Vertical-Attack)

Enclosure 1, Appendix 1.2. "Vertical" Synchronization*



The "BATTLE TEAM"

Maneuver → Operational movement
Fire Support → FIST to Corps Artillery
Intelligence → GSR to national intelligence
and ●●● **ORCHESTRATES** and ●●●

Hypothesis: Execution of Airland Battle requires development of highly effective "orchestrators" or "BATTLE TEAMS" for each Functional Mission Area/BOS up the tactical chain of command from the smallest to the highest relevent tactical echelon, normally Corps

- Tables executed "crawl,walk,run" to increasingly complex tasks and challenging conditions.
- BOS "team" provided normal command/staff support unless indicated otherwise.
- "Automated"collation of AAR info for desired MOE for each BOS at each echelon. Other BOS Manned, SAFOR or IFOR per training required.
- OC or OE requirements responsive to command modifications required by unit distribution.
- Predetermined METT-T to ensure specific MOE/MOP for training/evaluation in the AAR.

Coordination Tables

Coordination Tasks: Fire Support

- Plan Fire Support of a Bn TF deliberate defense (Proposed Bn Table 5) Fire Support available includes Mortar and Field Artillery HE.
- As above, Fire Support expanded to include CLGP (Copperhead), DPICM, FASCAM and Attack Helicopters. Plan counter- preparation ; Arty Bde GSR.
- Execute FS Plan above (Proposed Bn Table 7) shift FS priorities at Bde or Div during defense

ILLUSTRATIVE EXAMPLES OF TASKS ACTUAL TABLES CONSTRUCTED BY PROPONENT FROM ARTEP-MTP DRAWING ON HORIZONTAL TABLES AS APPROPRIATE

Tactical ActionsTables

Tactical Actions Tasks: Fire Support

- Direct and Plan Fire Support for Bn TF Hasty Defense then Delay. (Proposed Bn Table 3) Fire Support includes Div counterfire employing Field Artillery (MLRS) and NGF, immediate JAAT of Regimental size EA and JSEAD for immediate CAS
- Plan, Monitor and Direct Fire Support Bn TF Hasty Attack then Hasty Defense (Proposed Bn Table 1A). Hasty Attack includes a preparation,neutralization and obscuration fires.
- As above, integrate nonlethal - EW

Reaction Tables

Reaction Tasks: Fire Support

- Plan, Monitor and Direct Fire Support Bde TF Hasty Attack then Hasty Defense (Proposed Bn Table 1B extended to Bde) on Division boundary with regional ally. Maneuver Bde directed to "support" ally.
- Situation above, now Plan, Prepare and Execute Fire Support of the Ally by an Arty Bde with priority for CAS, JAAT and NGF.
- Execute proposed Bn Table 3 at reduced CSR, at 70% strength of personnel and equipment and with OPFOR at 2 to 1 superiority in Fire Support units.

- Tables include Fire Support Planning and Fire Support Execution tasks as defined in USFAS "Red Book". Tasks are focused at Bn, Bde and Div echelons.
- In each of these situations, multiechelon Fire Support command and staff personnel are assembled from Company FIST to Corps Artillery to ensure that vertical "teaming" within the Fire Support BOS of the contingency force package occurs.
- Other BOS Tables would be developed using similar methodology.

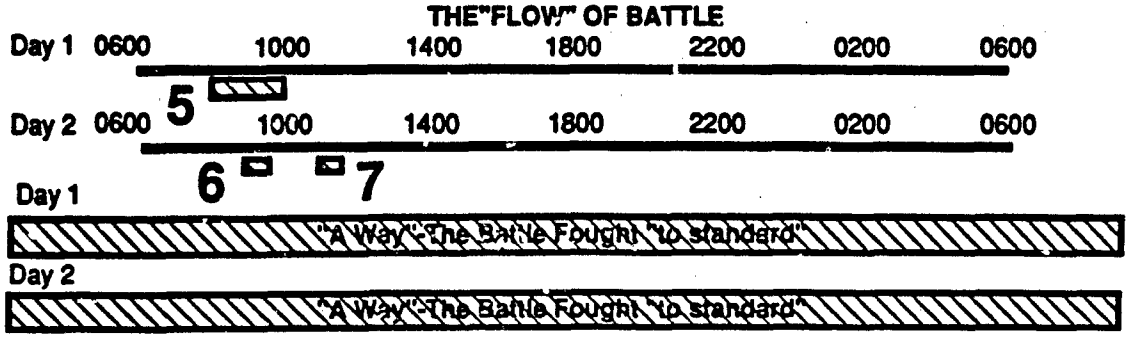
Enclosure 2,

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1.2-18

Enclosure 3, Tab a, Appendix 1.2. Creating BCST Tables (Horizontal and Vertical)

Methodology: **"Fight" a Battalion Task Force Deliberate Defense through Planning, Preparation and Execution to create "a way" then expand unit-oriented (Bn) horizontal tables (5&7) to vertical tables to train the BOS (Fire Support in example)**



Snapshots of Battle Proposed as Bn and FS Tables

Planning: Analysis,Integration and Ord

TABLE 5

Day 1 Brigade Defense Order received at 0600, Bn Cmdr's Initial Guidance at 0800.**BCST Requirement:** Command and Staff Planning for Bn Deliberate Defense. Table Duration: 120 minutes real time commencing 0800. **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

COORDINATION TABLE FIRE SUPPORT PLANNING

Extend Proposed Table 5 to plan the Fire Support including Mortar, Field Artillery, Copperhead, DPICM, FASCAM, and Attack Helicopters. Planning from Co FIST to DIVARTY FSE. **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

Execution: Movement, Maneuver and Objective

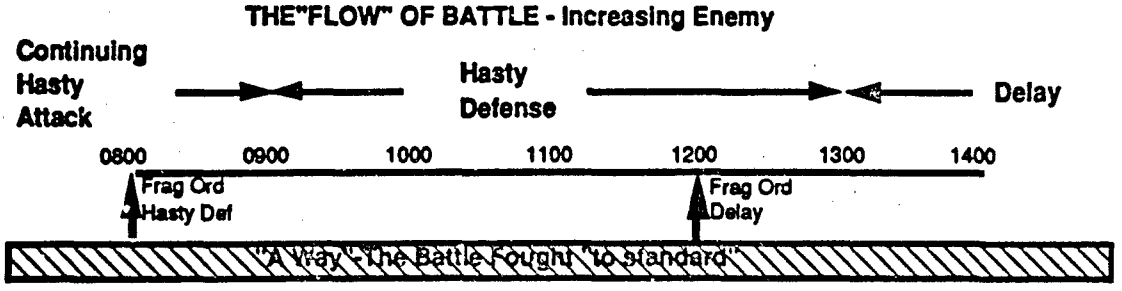
TABLE 7

Day 2 Deliberate Defense. **BCST Requirement:** Conduct of Deliberate Defense. Table Duration: 30 minutes real time commencing 1030. (Battle Handoff 1000). **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

COORDINATION TABLE FIRE SUPPORT EXECUTION

Extend Proposed Table 7 to execute the Fire Support from Co FIST to DIVARTY FSE. **Training/Evaluation:** Fire Support "Battle Team" performance in execution of Fire Support Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

Methodology: **"Fight" multiple, overlapping Bn TF missions which require simultaneous Planning, Monitoring and Directing. METT-T varied to increase the difficult of the BCST challenge. Create "a way" then expand unit-oriented (Bn) horizontal tables (1&1A) to vertical tables to train the BOS (Fire Support at Tactical Actions level in example).**



Snapshots of Battle Proposed as Bn and FS Tables



TABLE 1

(Basic Coordination)

Hasty Attack under way, increasing resistance. FRAGO change of mission to Hasty Defense effective at 1030 received at 0900. Commander's initial guidance provided. **BCST Requirement (Horizontal):** Planning for Hasty Defense while Monitoring continuing Hasty Attack. Table Duration: 60 minutes real time commencing 0900. **Training/ Evaluation:** Unit performance in designated Measures of Performance in Table Snapshot compared to same MOP recorded in "a way" to identical METT-T (from CTC?).

TABLE 1A

(Tactical Actions)

Hasty Attack under way, significant increase in unanticipated resistance. FRAGO change of mission to Hasty Defense effective at 1000 received at 0900. **BCST Requirement (Horizontal):** Bn TF Planning for Hasty Defense while Monitoring continuing unsuccessful Hasty Attack. Table duration 60 minutes real time commencing 0900. **Training/Evaluation:** Unit performance in designated Measures of Performance collected by Tactical Engagement Simulation and Manual Data Collection.

TACTICAL ACTIONS TABLE FIRE SUPPORT (PLANNING & EXECUTION)

BCST Requirement (Vertical): Extend Proposed Table 1A to execute the Fire Support from Co FIST to DIVARTY FSE. **Training/Evaluation:** Fire Support "Battle Team" performance in execution of Fire Support Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

NOTE: FS in example, could be Intel, CSS, ADA, etc.

APPENDIX 1.3

CONCEPTUAL INNOVATIONS IN BATTLE COMMAND/STAFF TRAINING (BCST)

APPENDIX 1.3
CONCEPTUAL INNOVATIONS IN BATTLE COMMAND/STAFF TRAINING (BCST)

Several new concepts have been directed at the challenge of distributed BCST for the Total Force. They are:

BCST = TASK MASTERY + EFFECTIVE STAFF TEAMS

BCST focuses on training commanders and staffs in two major areas. The first is command and staff mastery of the individual and collective tasks prescribed by Battlefield Operating System by the TRADOC doctrinal proponents. *Staff Task Proficiency* must be developed both by individual staff officers and by small staff teams. These tasks are trained and evaluated by Observer/Controllers. The second component of BCST is *Battle Staff Effectiveness*--individual and team mastery of the processes of Organizational Competence and Battle Staff Integration. These skills are trained by the chain of command with support and evaluation provided by O/Cs trained in Organizational Effectiveness skills (OEs).

PERFORMANCE-BASED STAFF TRAINING

New TES (virtual, constructive and subsistent simulation) permits redesign of Battalion/Brigade echelon command staff training to focus on performance (i.e., measurable warfighting outcomes of staff actions) rather than mastery of the process of staff actions which has been the traditional approach. Effective, efficient staff process is important but it is not the objective of staff proficiency. *The criterion of merit of command staff performance is integrating BOS to achieve warfighting success consistent with the intent of the chain of battle command.* BCST trains by repeated command staff immersion in battle and effective AARs. Process complements performance as it must in battle.

ALB Mandates Both Horizontal and Vertical Staff Training

To execute Airland Battle doctrine, BCST must address both horizontal (unit) and vertical (battle functions) staff actions. Horizontal BCST prepares the command staff team

to focus the seven BOS to battle purpose at Battalion or Brigade. Vertical BCST integrates each BOS (Maneuver, Fire Support, Intelligence, Command and Control, Air Defense, Mobility, Countermobility, Survivability, and Combat Service Support) from the lowest to the highest echelon of command.

Immersion in Battle Enables Intensification of Training

Intensification of the BCST training process for RC use requires immersion of the individual or unit in battle situations by the use of new training techniques such as "instant replay" and "fast forward" enabled particularly by simulation. The result is significant compression in the time required to train staffs to standard.

Distributed Training to Standard Through Table Training Exercises and Tailoring Training to Competence Level Desired

Tables, replicable vignettes from Battalion or Brigade "days of battle" in TES, are established as a uniform training technique which permits BCST to standards established by the doctrinal proponent. Combined with thoughtful AARs by competent OCs, Table exercises permit distributed quality BCST to standard.

Train by Direct Comparison to Performance to Standard

BCST employing TES trains by exposing unit command and staff (horizontal) or Battlefield Operating System (vertical) staff performance to "a way"--highly competent execution of tactical missions--compared in detail to "your way," execution of the same mission to the same METT-T (Table) by the unit or BOS undergoing BCST training.

BCST--a Total Individual and Collective Training Package for Institution and Unit

BCST for RC provides for not only the mission training of the unit or functional BOS staff but also for the institutional or unit training of the individual staff officers and staff teams to prepare them for operational mission readiness in tactical units. Total immersion in battle vignettes enables comprehensive training programs for institutional and unit training programs.

PRACTICAL APPLICATION OF CONCEPTUAL INNOVATION

Concepts gain understanding when they are related to daily operational environments. Relating concept to practical application seems particularly necessary with BCST. Practical outcomes are hard to visualize when the several conceptual innovations described above are combined. To ease visualization, assume that all the training and technology development proposed in this Paper has occurred successfully. The Guard force is executing the new strategy and training programs. Let us visit a typical Armor Battalion training BCST.

4-123 Armor faced a tough training challenge this year. They have upgunned to Abrams and Bradleys during the past three years. The training focus has been on NETT of the new equipment leading to Platoon level gunnery and tactical training. Drawing heavily on use of TES particularly MILES and SIMNET in structured exercises, they are now considering Company-level training and getting back to training of the Battalion staff. Of course, there are very tough challenges in sustaining their necessary "Bold Shift" proficiency, but these challenges are manageable this year because the Battalion is taking advantage of the new intensive Tank Combat training.[1]

Battalion staff training seemed a particularly difficult challenge this year. Last year, the staff conducted an ARTBASS exercise with support from the Readiness Group, but the training focused more on the staff planning process than on preparation and execution. It did not seem to have helped much when the battalion came on state duty to handle unexpected problems of coordination within and between several counties when the hurricane hit. The staff just did not operate very smoothly. Then the S4 was promoted and went to Brigade and the S3 got a job transfer out of state so there was a new staff.

Then, staff training really came to the front burner when Brigade announced that State had entered all the maneuver battalions in the "voluntary" BCST Stakes created by CINCFOR to encourage Total Force command staff proficiency for contingency operations. Standard BCST Tables drawing on CTC Lessons Learned had been created in distributed virtual simulation. Each battalion would receive the same (identical METT-T) Context, "a way" Table, and "a way" AAR. The challenge was to execute "your way"

1 For a discussion of this aspect of intensified training, see Enclosure C, Structured Training, "A Simulation-Based Intensified Training Readiness Strategy For The Reserve Component." IDA Paper P-2611, December 1991, pp. C-13-15. An objective typical MUTA 4 training at an Armory and WET site is described. The focus is AFV and Platoon-level training with a Battalion-level Fire Coordination Exercise on Sunday. Assume that this lower echelon training also occurs in 4-123 Armor.

satisfactorily. There were no secrets, the challenge was to be able to demonstrate not only effective staff planning but also solid performance--"your way" compared to the "a way" demonstrated by a solid unit at the CTC. Although these Stakes had appeared several months ago to be more "help" than 4-123 Armor could stand, the BCST training conducted during the past several months has made all very confident. With the Stakes only three weeks away, 4-123 feels ready. So much so that they have just started into Stake Table Context Preparation with the individual staff officers and small staff teams. What had they done earlier to make them so confident now?

First and foremost, when they laid out their training plan last year, they took the FM 25-101 planning sequence very seriously. They organized their long-range, short-range, and near-term training plans. The commander decided that their BCST Table training objective would be successful "your way" execution of the mission Deliberate Defense, planning, preparation and execution phases.[2] (Three Tables: Deliberate Defense, Planning; Deliberate Defense, Preparation; Deliberate Defense, Execution). While all immediately looked forward to the MUTA 4 when the three Tables would be executed, the commander wisely focused initially on Context Preparation. He wanted to be certain that the individual staff officers, particularly but not exclusively the new S4 and S3, knew their jobs. Fortunately, all this training had been designed for distributed execution--at home or work site--so execution of the plan was not tied to negotiating Additional Training Assemblies.

CONTEXT PREPARATION

Each of the staff officers received a combination paper and TV cassette-based diagnostic assessment of their knowledge of the general responsibilities of their staff position and those responsibilities associated with a deliberate defense mission.[3] The diagnostic assessment resulted in a recommended individualized training program covering Staff Task Proficiency in three general areas: general S- staff officer tasks, S- responsibilities in Deliberate Defense and performance of the actual "a way" unit S- to the instant of initiation of the Table. While the majority of this officer training was designed to be self paced, "mentors" from the Readiness Group or Resident Training

2 The alternative in basic BCST Tables documented with full multi media training support is deliberate attack. Other BCST training draws on the basic Tables by "What If" variations in the frozen METT-T of the Tables--effectively converting the Tables into STXs.

3 This example draws on current technology. The fielded future program would add virtual or constructive simulation distributed to home or work site.

Detachments were available by telephone or E Mail or in person to conduct "off line" coaching. Similar help was available for the commander in executing his tactical responsibilities. Each Guard Battalion monitors this Context Preparation differently. Commander 4-123 opted to have the Battalion XO check the S4 and S3 out on their execution of the self paced program.

Basically the same individualized training was provided to the small staff teams. Now the Staff Task Proficiency focused on team tasks so the members of the team (such as S2, S3, FSO) had to train together at the Armory or be networked at individual work site or home. Most units monitor this group paced training carefully since it is so essential to effective overall staff performance. Commander 4-123 decided to use RTD support to both mentor and to provide assessment feedback on this small team training. This also solved the problem of training Battle Staff Effectiveness. One of the RTD officers had received tactical OE training at Knox. He conducted training in organizational competencies for the small staff teams and monitored Battle Staff Integration skills during selected portions of the group paced distributed small staff team training.

The battalion commander and staff as a whole did not address BCST until the MUTA two months in advance of the scheduled BCST. At that time, the CONUSA/RG (or State) BCST Team came in to brief the command and staff group on the BCST sequence of Context, "a way" and "your way" Table, "a way" and "your way" AAR, and potential "What If" STX alternatives.[4] At that time, recommended self and group paced training alternatives were discussed and appropriate modifications made to accommodate unique training requirements in 4-123 Armor.

More substantial support was provided during the MUTA just preceding the BCST MUTA. Two UTA were devoted to BCST preparation by the Battalion Commander and staff.

UTA 1: Structured discussion of the coming BCST MUTA. Discussed "What will happen when" stimulated by presentation of the "what happened summary" from the "a way" AAR. Reviewed the "a way"-"your way" Context material. Then there was OE/OC discussion (from Discussion Guide) of explicit staff requirements in preparation for and in

[4] There are also "a way" Modules--subsets of Tables addressing individual staff officer or small staff team tasks. Modules are not discussed here. They probably would have been used in the self and group paced training discussed above.

execution of BCST--such as the requirement to recreate the field Battalion TOC environment during Table execution.

UTA 2: Entire "a way" AAR was presented to the Commander and XO with commentary by OE and OC present for BCST MUTA. Key Staff Teams such as S2, S3, FSO, and S1, S4 viewed and discussed the Context for their Staff Team with the appropriate OC/OE. All material was available to be taken home in TV cassette and paper. OC/OE were available to answer questions, provide additional doctrinal material for preparation at home or worksite between MUTA-1 and BCST MUTA. Then each staff officer was provided a copy of the Table derivative Module (TV Tape) for his staff position for review at home. NOTE: This training support issue was for those who had not become actively engaged in the individual or group paced training discussed above. An OC was available by telephone to answer questions.

At this time, the precise schedule was determined for the BCST MUTA. Consistent with the commander's guidance, three Tables were planned. Each Table (Deliberate Defense planning, preparation, and execution) was anticipated to last four hours with the time divided generally as follows: Context: 20 to 30 minutes; Table duration: 2 hours (planning) or 30 minutes (preparation and execution).[5] The remainder of the UTA was to be allocated to the AAR allowing 30 minutes for AAR preparation. The last UTA of the MUTA 4 was reserved for What If exercises--modifying the Tables' METT-T to build STX to respond to command training concerns.

CONTEXT

By the time the BCST MUTA arrived, 4-123 was ready. All of the staff officers were fully familiar with the "day of battle" at the CTC from which the three Tables had been drawn. That is what they had been training to for the preceding two months, self and group paced. The purpose of each Context (one for each of the Tables) was to bring the commander and staff officers to the instant of initiation of the Table understanding what immediately preceded their involvement. The unit "big picture" was provided by an IMAX type visual summary of activity up to the instant of initialization presented to the entire staff, then operation graphics and communications net traffic were presented to each staff

5 For additional detail on the Tables assumed here for illustrative purposes, see Tables 5, 6, 7 discussed in Figure 3.1-2, Appendix 3.1

officer for the 5 to 10 minutes of the "a way" Context which immediately preceded initialization of the "a way" Table.

TABLE

The Table began at the instant of initiation. Events occurred real time for the preagreed duration of the Table. All outcomes were based on orders of the commander and his staff as they executed their way or "your way" as discussed in this Paper. The first Table was rough. Officers did not fully comprehend that nothing would happen unless they took explicit action in response to a changing situation. The simulation was not on Autopilot! By the second Table, most understood. In fact, the more adventurous wanted to "What If" alternatives from the "a way" METT-T. One or two realized that they really did not know as much about their staff position as they thought and wanted to "do the Table" again to get it right. By the third Table, Deliberate Defense execution, the Battalion command and staff started to hum. They understood not only what and how each needed to perform to conduct a successful defense but also they realized what they needed to do to continue to develop requisite staff skills, individually and collectively. The FSO was concerned that that there was not sufficient acknowledgment of the effects of concentrating fire support. He wanted better representation of the entire Fire Support BOS. In general, reaction was split between those who wanted to go back and "get it right" and those eager to "what if" in new warfighting situations.

AAR

The most powerful learning occurs in the AAR. The "a way" AAR had been available to 4-123 Armor for several months. It was helpful as a coach of what could happen but real "ah ha!"s did not come until the "your way" AAR. The excitement and emotion of intense personal involvement made it entirely different. Seasoned Tankers equated the BCST AAR to the Table VIII AAR when everybody hung on each word of the Tank Crew Evaluator.

Given his staff turnover, Commander 4-123 had asked for a special set of AARs. Each of the three was different. All three started with the equivalent of the NTC 7-minute summary of "your way" execution. Then they became very specific comparing how the individual staff officer or small staff team had done in comparison to his peer(s) in the "a way" unit. The first AAR (Deliberate Defense - planning) focused on the individual staff officer tasks. OCs talked individually with each of the staff officers and suggested

improvements for the next Table. The AAR for the second Table (Deliberate Defense - preparation) emphasized small staff team performance. OCs grouped the various teams comparing "a way" with "your way" for that particular team. They were joined by OE observers who discussed organizational competence within the small staff teams. The third AAR was focused entirely at the Battalion commander and staff as a unit team. Both OC (Staff Task Proficiency) and OE (Battle Staff Effectiveness) commented on "a way" contrasted with "your way."

"WHAT IF"

By now, 4-123 Armor felt as if it had been put through the wringer. After some discussion, the commander decided to go ahead and do a "What if" rather than refight one of the earlier Tables. Since they had done relatively well in the third Table (Deliberate Defense - execution), he decided to execute it again but to double the size of the enemy. It was a disaster. To this day, the FSO claims that the defense would have succeeded if he had just been able to get Division to reallocate the MLRS. That was the origin of the ongoing effort to create the vertical BOS Tables starting with Fire Support.

That is a practical example of potential BCST in execution. Again, a summary of what is new:

CONCEPTUAL INNOVATIONS IN BCST

- BCST = Staff Task Proficiency + Battle Staff Effectiveness
- TES enables performance, NOT process-basing of staff training
- ALB mandates horizontal and vertical staff training
- Immersion in battle through TES intensifies training
- Tables permit distributed training to standard and tailoring training to competence level required
- Train by direct comparison to performance to standard
- BCST: a total individual and collective training program for institution and unit.

APPENDIX 2.1

AAR TRAINING DEVELOPMENT

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AAR TRAINING DEVELOPMENT

The focal point of much of the training and technology development associated with the DARPA-National Guard BCST program is support of the major training event, the After Action Review. The AAR is the dominant training support provided to the unit chain of command. It combines the excitement of immersion in warfighting with the rigor of explicit performance data presented in a positive training environment by experts dedicated to supporting unit training. Therefore it should be developed with care. Fortunately, there has been excellent research on the AAR conducted in association with BCST. ARI prepared early guidance for the conduct of AARs associated with the fielding of the Army Training Battle Simulation System (ARTBASS):

> Purpose of the AAR.
>
> During a command group training exercise, feedback should be provided to increase and reinforce learning. The AAR provides a sound method for diagnosing unit training needs and is an effective teaching technique. All key players participate in an AAR, so it provides a rich data base from which teaching points can be drawn. The AAR is structured around sequential exercise events, and the AAR leader guides the discussion by asking leading questions. Therefore, participants may be guided to identify critical events, to explore the reasons for actions taken, and to recognize tentative solutions to problems and alternative courses of action.[1]

This guidance is applicable to both horizontal and vertical BCST.

Unfortunately ARI research presents a spotty picture of current AAR practice for BCST.

> At present, the AAR [for Command Group training] consists of general observations concerning the conduct of the battle, which provides the staff with little objective feedback concerning how well or how poorly their individual and collective tasks were performed. Effective extrinsic feedback requires that performance measurement data be systematically collected throughout the training exercise. This will supply the information required

1 Kaplan, Ira T., and Jon J. Fallesen, *After Action Review (AAR) Guide for the Army Training Battle Simulation System (ARTBASS)*, ARI Research Product 86-32, October 1986, p. 1.

to provide the training audience with feedback to reinforce strengths and identify weaknesses.[2]

While those comments are based on ARTBASS and other pre-CTC-Battle Command Training Program (BCTP) training support, they reflect the "state of the art" of BCST available today for most Guard units. For them, the quality of command group training (BCST) really has not changed, particularly the difficulty in providing timely performance data on which to base effective AAR feedback.

Research has continued as the Army training system has matured. We now know that the AAR should have the following characteristics as defined by ARI and confirmed in the CTC:

1. Training objectives are reviewed.
2. The battalion's discussion is directed to the critical events, reasons why these occurred, and how the battalion could have done better.
3. The chain of events is traced so that the results of mistakes are understood by participants. One mistake is often a partial cause of another.
4. Critical events are clearly related to training objectives.
5. Attention of participants is held and they are involved in the discussion.
6. The summary is clear and concise.[3]

All of the research literature and CTC experience highlight the absolute need for specific detail of both satisfactory and unsatisfactory task performance. Hopefully the staff undergoing BCST will identify the good and the poor and why. If they cannot, the AAR leader must be prepared to do so. And he or she must be prepared to discuss not only what happened but also what did not happen and why. Several sensible general principles for BCST AAR have been proposed:

PRINCIPLES

- All members of designated training audience should receive feedback.
- The feedback presenter projects competence and confidence in subject area while interacting to show he is trustworthy and non-threatening.

2 Delane K. Garlinger, *Feedback Principles for Command Group Training*, ARI Research Report 1459, December 1987, p. 1.

3 Kaplan and Fallesen, p. 16.

- Provide at breakpoints or end of exercise "as soon as possible."
- Best is specific feedback directed at specific goals with specific support provided for the feedback.
- Provide a total picture--both positive and negative feedback. Negative should include alternative courses of action to correct mistakes as well as type, extent and direction of errors.
- Normative data if possible--as a benchmark.
- Praise and encouragement as appropriate.[4]

Research has been translated into practical specific AAR counsel for the unit in the ARTEP 71-2-MTP, *The Tank and Mechanized Infantry Battalion Task Force*. Note the concern about vertical coordination at underlining below.

g. After-Action Review

(1) A series of AARs are conducted from battalion level through platoon level. This provides the full benefit of active participation and informative feedback. The size of each group level should be tailored to enhance learning. The key to AARs is interaction of people; AARs should not be a lecture. The following is a sample format:

(a) Review the brigade mission intent/concept.

(b) Give a brief summary of the sequence of events and what happened.

(c) Review friendly plan.

(d) Review OPFOR plan.

(e) Review planning and preparation for battle in terms of the operating systems, using the AAR collection charts.

(f) Review the results of the operation, using the AAR collection charts.

(g) Review the execution of the operation in chronological order.

(h) Discuss results in terms of the seven operating systems (weak points and ways to improve performance), using the AAR collection charts.

(i) Summarize.

[4] Garlinger, pp. 1-3. Now that objective data is possible, it is preferable.

(2) Chief observer/controller guides the AAR. One method of starting the AAR is to ask each participant what went well and what needs improvement. These points should be listed on a chart or butcher paper to help facilitate the discussion. The OPFOR commander or representative should explain his order and plans for the operation as well as any observations on how to improve TF performance. This allows the TF to see what they were fighting against and why some of the actions happened. The chief observer/controller states what happened (facts), and then asks why it happened. Each participant learns from the others and from his leaders. All players work together on identifying and correcting weaknesses. In this way, there is more involvement in their own professional development. The sequence should follow the flow of the battle and focus on the battalion performance. Normally the brigade commander summarizes the final comments at the end of the AAR.

(3) Platoon, company, and system (main CP, combat trains CP, field trains CP) AARs are conducted before or after the battalion AAR and follow the same sequence of events. Operating systems AARs are normally conducted at least once during or after the exercise with the principal operators of the operating systems to work out the details of improving that system's performance. An example would be the FSO, FSE, mortar platoon leader, and FIST chiefs with company commanders and S3s for the fire support system or XOs, support platoon leader, first sergeants, FSB staff, BMO, medical platoon leader, and S1, and S4 for the combat service support system.

(4) At the completion of the AARs, all soldiers and leaders/staff in the TF should know what they did, areas that need improvement, and how to improve....[5]

This is solid guidance but it does not explicitly address the challenges of command staff training and how the AAR needs to be structured when BSCT is a major purpose of the unit training exercise. There are several groups of tasks which should be addressed explicitly in the BCST AAR. They are individual staff officer proficiency in his or her staff responsibilities (the S2, S3, S4 ,etc.); the proficiency of small groups in causing complex actions to occur cross BOS (such as merging Intelligence and Fire Support to place timely fires on the enemy); and the collective tasks which are the sum total of the individual and small team tasks performed by the Brigade or Battalion staff. These tasks are defined in the various doctrinal publications which establish the current warfighting doctrine--Airland Battle. These are generally well defined by task, condition and standard in useful formats which shall be discussed below.

5 ARTEP 71-2-MTP, *Mission Training Plan for The Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 6-14, 15.

However, doctrinal task lists are useful but not sufficient. They do not include group teaming skills across the entire staff team at both Battalion and Brigade. How does the battle staff respond as a team on a dynamic changing battlefield? "Is their act together" despite accelerating change and often unforeseen change? Are they "pulling together" as a team? These are a range of skills over and above mastery of the various individual and collective tasks of Airland Battle. Now we are concerned about the battle staff functioning effectively as a unified integrated system. The effective battle command staff team must possess organizational capabilities to:

(1) Search out, accurately identify, and correctly interpret the properties of operational situations as they develop.

(2) Solve problems as they occur within the context of rapidly changing situational demands.

(3) Generate flexible decisions relevant to changing situations.

(4) Cope with shifting situational demands with precise appropriateness.[6]

This is a much different issue than mastering the execution of complex tasks. It is a challenge of developing organizational competencies: sensing, communicating information, decision making, stabilizing communicating implementation, coping actions and feedback.[7] Fortunately, excellent conceptual work in this area has been done by Joseph A. Olmstead in developing a model of Battle Staff Integration. Understanding this model is of such importance to understanding BCST that the Executive Summary of Olmstead's work is included at enclosure.

It seems clear that any development model of BCST must include both task performance to standard and development of organizational competence in the unit. To structure training development of BCST, I define BCST to consist of both Staff Task Proficiency and Battle Staff Effectiveness. Staff Task Proficiency consists of individual staff member tactical and technical competence. Individuals know the relevant doctrine and they know how to apply it consistent with the mission and command intent. The second component of Staff Task Proficiency is the tactical and technical competence of the small staff teams such as the S2, S3 and FSO who must work together across Battlefield Operating Systems to synchronize the battle. They too must have tactical and technical proficiency as a team. Their competence must be not only to coordinate across BOS at

6 Olmstead, Joseph. A., *Battle Staff Integration*, IDA Paper P-2550, February 1992, p. S-1.

7 Ibid, p. V-3.

Battalion or Brigade but also to coordinate vertically up and down the echelons of the Battlefield Operating System their staff responsibility represents.[8]

Battle Staff Effectiveness, as developed by Olmstead, consists of Organizational Competence and Battle Staff Integration. The functions of organizational competence were described above. The objective is quality performance of these functions. Battle Staff Integration occurs:

> (1) when organizational conditions are conducive to cohesion and teamwork, and (2) if developmental activities within the unit are designed to propagate high skill levels, stable team norms, and strong values for teamwork. Necessary Organizational Conditions include (1) a clear role system, (2) common superordinate goals, (3) a system of rewards for teamwork, and (4) a stable and efficient organizational system. Necessary Developmental Activities include (1) cognitive role training (individual), (2) battle staff experiential training (team), (3) unit operational training, and (4) shared success experiences.[9]

Training development is required to ensure that both competence and staff integration are achieved.

The model then is BCST consisting of Staff Task Proficiency and Battle Staff Effectiveness. Task selection comes later (App. 2.2). For now the challenge is the design of the AAR. Ideally, the AAR would flow entirely from the flow of the battle. The detailed AAR would not be determined until the mission has been fought. That flexibility is not necessarily desirable or necessary when the BCST Table and AAR are to be conducted for basic level BCST task training, particularly when the training is to be widely distributed across the National Guard. Training opportunities for both Staff Task Proficiency and Battle Staff Effectiveness need to be provided. To ensure quality of evaluation to task, condition and standard and to establish uniform standards for the conduct of basic staff training, one special purpose AAR is proposed to be oriented to "a way" the particular mission (Table) is fought by a highly competent unit.

"A way" describes the execution of a warfighting vignette in a "day of battle" initialized with a carefully defined starting METT-T (a Table). For example, for a given specified Table, initially:

[8] There is another competence, that of the leader or commander. That includes the task and organizational competencies listed as well as particular integrating skills. Explicit leader development is the subject of another paper.

[9] Ibid, p. S-2.

Mission is determined--Hasty attack

Enemy is determined, size, location, combat effectiveness and mission--Motorized Rifle Company, Defend, Platoons at ___, orientation __.

Troops are determined--Tank Battalion, 2 Tank Co, 2 Mech Co at specified combat effectiveness.

Terrain is fixed--same digitized terrain with each object precisely placed initially.

Time Available--fixed schedule of events, the clock starts at ____hours for all. Real time (generally 30 to 60 minutes) is the same for all. "A way" also describes the resultant AAR of the execution of highly competent warfighting. Both execution of the "a way Table and the resultant "a way" AAR are the essential training mechanisms to train unit commanders and staffs to training objectives established by the BCST Proponent.

An important assist to the unit in training, the "a way" AAR is designed to cause effective learning to occur as it demonstrates how a first rate BCST team functions to fight and win. To do so, this special purpose AAR--"a way"--should have the following characteristics confirmed by years of AARs associated with effective unit training at Combat Training Centers:

1. The AAR supports the major training objectives prescribed for the Table by addressing each of the distinct training challenges--Staff Task Proficiency and Battle Staff Effectiveness--described above.
2. It is designed such that each training audience is presented :
 - a concise description of *what* happened to the "a way" unit and *why* it happened related to each of the major training objectives of that Table, and there is
 - a well-documented explanation in detail accompanied by training support drawing on training potential of immersion in virtual simulation usable for self-study before or after participation in the BCST Table training.
3. There is explicit evaluation employing the MOP/MOE appropriate to that Table situation. Documentation (mostly visual) is available for distributed use indicating not only "What Happened" but also "Why it Happened" and whenever possible, doctrinally proper alternatives or "Corrective Actions." It is difficult to project the most useful combination of training support for this

important training.[10] See App 2.4 AAR Training Support below. This should be confirmed by TEA.

4. The AAR demonstrates interaction between the Commander and Staff of the "a way" unit and the associated training support such as OCs and OEs trained to assess and counsel on Staff Task Proficiency and Battle Staff Effectiveness. The purpose of the "a way" AAR is not only to demonstrate "how to" execute the various tasks to standard but also to demonstrate the interactive nature of the AAR process to leaders of the Guard unit preparing to conduct the Table and following AAR themselves. In effect, the AAR shows how to use the new kinds of training support which Tactical Engagement Simulation enables. The AAR of the unit in training developed when the unit in training "fights" the Table (the "your way" AAR) should be fully interactive between the unit staff members, the warfight represented by the unit's execution of the Table in TES and the unit trainer or OCs/OEs conducting the AAR.

While the "a way" AAR provides useful training support, the major training product of structured BCST should be the actual AAR conducted by the unit in training after it completes the Table. This "your way" AAR should be evaluated by MOP/MOE comparison to the special purpose "a way" AAR prepared for that Table. For training of units, the same MOE/MOP displays could be used with two sets of data, visual or audio displays--"a way" side by side with "your way"--the actual performance data collected as the unit was executing the Table. The AAR support material would be designed to highlight differences between "a way" and "your way," then to discuss possible reasons for variations--hopefully issues raised by members of the unit in training who have had the opportunity to preview the "a way" AAR prior to execution of the Table themselves.

There are numbers of "your ways" all equally successful in addressing the tactical challenge posed by the Table–including from time to time sheer "dumb luck." The purpose of the "a way"-"your way" comparison is not to force "a way." In fact, it is to encourage initiative in developing sound innovative solutions while permitting focus on training and evaluation to agreed MOP/MOE.[11] It seems highly likely that there will be substantial

10 For TES-virtual simulation, ARI Knox speculated a ratio of about 50 percent Plan View Display, 30 percent Stealth "out the window," and 20 percent statistical information. Estimates vary. Tips for the Trainer notwithstanding, it seems likely that each commander will develop "his" best mix.

11 There is acknowledged risk that this approach may cause overemphasis on duplicating "a way" task performance. Of course, for basic BCST, demonstrating competent task performance to standard on "a way" almost as a "gate" is not bad provided the unit is then encouraged to innovate. As a practical issue, "a way" tied to explicit METT-T of a Table permits an essential narrowing of simulation and MOP data capture requirements for the training and technology developer in the Proof of Principle stage of concept development KISS.

differences in how the various components of Staff Task Proficiency and Battle Staff Effectiveness are best presented in AARs. There probably is no single "best" way. This is another area for evaluation by Training Effectiveness Analysis.

There is one additional characteristic the AAR should possess when it is conducted of "your way" to fight the Table. The AAR should contribute directly to effective follow up command and staff training by the unit. This additional characteristic is:

5. The AAR experience leads directly to explicit recommendations for remedial training to cure the training ills diagnosed in the final AAR. These recommendations are packaged in such manner that they could be selected by the chain of command as a prescriptive remedial training program either in a unit or institutional context. In other words, the BCST process culminating in the AAR can not only diagnose but also it could identify various exercises. Utility for subsequent unit applications is one characteristic of the Objective AAR discussed in App. 2.5.

That is the relatively traditional view of current AAR design applied to a new training opportunity. This is a proven, effective training methodology but it may not advantage sufficiently new training opportunities coming with new training technologies. More should be possible with Tactical Engagement Simulation (constructive and virtual).[12] New technologies should be able to improve the AAR process itself at Battalion and Brigade echelons with thoughtful definition of requirements to advantage new capabilities. For example: why think of the AAR as a one-time event related to feedback to a unit on "how they did" in accomplishing a demanding mission? Rather think of the formal AAR as both the immediate feedback to individual staff officers, staff teams and the overall command staff team and as a carefully crafted springboard to stimulate a much more extensive program of further self or group-paced training based on the shared BSCT experience of Table execution. The AAR itself, ready shortly after completion of the BCST exercise, should be structured to be the stimulant to further unit training either grouped or distributed.[13] The AAR is not an end but rather the start of a continuing dialog which stimulates BCST. AARs establish a common experiential baseline for subsequent training.

12 Tactical Engagement Simulation consisting of constructive simulation--JANUS (Corps Battle Simulation [CBS], a.k.a. Joint Exercise Simulation System [JESS], or Brigade Battalion Simulation [BBS]) as well as virtual simulation (SIMNET).

13 Grouped unit training when the training is conducted with the commander, XO and principal staff are assembled in one location for training. Distributed unit training when the command staff team is spread to several armories, work sites or homes. In the AC context--distributed when not at a TRADOC or AC unit site--all Guard unit training is distributed.

Several new challenges or opportunities arise for substantial improvement in the AAR as it is currently practiced:

- Design the sequence of the AAR itself to reinforce improved battle command staff operations. The AAR sequence should probably reflect the order of the tactical decision making process.[14] Initially the ARI-developed sequence reflected in Combined Arms Battle Tasks--Planning, Preparation and Execution--seems best but training in execution of BCST in multiple simultaneous operations should quickly follow. For that, the best AAR sequence is probably to address in turn Monitoring, Planning and Directing. Of course, the specific AAR design will be strongly influenced by the particular stage in battle command staff execution which is reflected in the vignette of the "day of battle" selected for the Table supporting the training objectives of the AAR. If the Table is focused on thirty minutes of execution of a Battalion TF Defense, the AAR will naturally focus on staff actions required immediately preceding and during that thirty minutes of execution. However, once alternative actions or "what ifs" are discussed, all phases of tactical decision making should come into consideration because staff preparation for the "what ifs" will seldom be limited to the real time period of the Table.

Note that the BCST described differs from current staff training. Enabled by new simulation, the emphasis is on performance in warfighting just as is the emphasis at the Combat Training Centers. The bottom line is "does it work?"--does the BCST result in battle success, not does it follow the dictates of process established by the schools? Unfortunately, most current institutional staff training is heavily focused on mastering repetitive staff processes.[15] As a result, there can be substantial problems when the process-oriented staff officer suddenly faces the rapid tempo, confusion and multiple mission environment of combat or its peacetime surrogate, the CTC. The BCST AAR and in fact all which is proposed for intensified Guard training using advanced simulation stresses performance in battle. Process is important. There is a discipline of thought which is absolutely essential to battle success. But the focus of the training here is battle performance as the stimulant and criterion of success. Consistent, competent performance

14 U.S. Army C&GSC, "Techniques and Procedures for Tactical Decision Making," ST 100.9, July 1991, has an excellent description of the decision-making process.

15 Process orientation reflects inability to do much else today in an institutional training environment. A great opportunity looms to employ distributed simulation to performance base institutional staff training by placing it in a unit warfighting context.

in the "days of battle" envisaged in the BCST Tables will simply not be possible without competent, timely battle command staff tactical decision making.

As discussed above, the AAR should be designed to train and evaluate Staff Task Proficiency and Battle Staff Effectiveness performance. Clearly, detailed feedback should be provided to each of the primary staff officers on his or her performance either before or after the group AAR. The feedback should be sufficiently detailed by MOP/MOE such that the individual can apply it successfully in executing position responsibilities in subsequent Tables. Specific recommendations should be included for remedial training designed to be doable at home or at local armory. Content of both AAR and the remedial training package should be prioritized by the Proponent for each of the primary staff positions--Ft. Knox or Ft. Benning for XO and S3, Ft. Sill for FSO, Ft. Lee for S4, etc.

Small team AARs should focus on the specific requirements or events which stimulated the interaction of the team. For example, one subject for AAR focus could be the S2, S3 and FSO coordination on Engagement Area planning or the S4 and S3 coordinating to ensure logistic support on limited routes. Small staff teams should be addressed in the larger group context in which they perform their tasks or work as a productive team. For horizontal BCST, that would be the balance of the battle staff team. For vertical BCST, it would be the functional BOS team at least one echelon higher and one echelon lower. For example, an AAR of Fire Support at Brigade should include fire support representation from Battalion and Division. Staff teams probably should have separate AARs infrequently. Understanding these numerous small team interactions is such a critical element in achieving unit battle synchronization that all members of the horizontal or vertical team should participate and thereby gain at least familiarization with the coordinating responsibilities of other staff officers.

Discussion of Battle Staff Effectiveness, particularly organizational competence, would be addressed throughout the AAR. The MOE are present in most any staff activity. For example, the MOE of sensing, communicating information, coping actions and feedback can be readily blended into the normal AAR process. As tactically oriented OE training support becomes available, it would probably be best provided off line to various individuals during the staff tactical training rather than during the AAR, but that would have to be validated by Training Effectiveness Analysis. Suffice to say that neither Staff Task Proficiency nor Battle Staff Effectiveness should dominate the AAR. Both are essential ingredients to battle command staff performance.

- Design the AAR in media, format and content to be suitable for not only immediate feedback on battle performance but also for intensive follow-on training on tasks needing additional training in collective mode (grouped or distributed) or individual mode--all as a training option "built in" to the AAR.

With the new capabilities of simulation, a very precise product can be created. The actions of objects--fighting vehicles, communications transmissions, rounds of ammunition, or views from optics can be frozen or tracked in detail over time. What new training opportunities could be possible if the AAR itself were to be optimized for most effective/efficient learning? For example, we know that immersion in an exciting interactive situation, competing against a skilled foe, enables a significant increase in rate of learning for Captains and Sergeants in combat units. The same potential can be realized from BCST AARs. Situational exercises can be set up for individual staff officer or staff team interactive follow-up action as an encouraged yet optional part of the AAR or as a remedial exercise prescribed by the chain of command. Which should be developed for individual or collective tasks for what purposes? Would it be useful to package various collateral operations like counterfire exercises for remedial training? There is a substantial training development challenge.

Routinely, the unit in training will have access to the AAR of the Table as it was executed by a highly competent unit--"a way" as discussed above. That AAR should be structured to provide a menu for the individual staff officer to pursue to study at greater depth what and how the comparable staff officer of the "a way" unit performed his or her responsibilities. How did the "a way" S2 keep the commander informed as the enemy situation changed during the battle?

Accessibility of the "a way" AAR is an effective yet subtle way to disseminate extensive Subject Matter Expertise hopefully itself designed by the Proponent to encourage self study of the more important training objectives of that particular Table. In other words, if the Intelligence Proponent is concerned that the average S2 in typical units be able to identify Target Areas of Interest (TAI)--areas where the commander can influence the action through fire and maneuver--as a part of Intelligence Preparation of the Battlefield (IPB), the "a way" AAR should include a menu which directs the S2 to extended training on the selection of TAI by the S2 who is portrayed in "a way."

Similarly, training in depth could be structured for the small staff team. IPB must be integrated in the tactical decision-making process, normally in war gaming. The S2 and S3 team can be offered extensive training in war gaming drawing on the tactical decision

making process actually used by the "a way" unit and captured for just this use. In sum, the documentation of "a way" execution can be packaged for subsequent use in distributed training similar to the TRADOC Common Teaching Scenarios. Properly designed, the "a way" AAR can be the gateway to this training.

There are even more possibilities associated with the AAR of Table execution by the unit in training--"your way." Now the individual staff officer could be provided the opportunity to "what if" alternative staff planning. For the S4, what if the ammunition prestock had been three kilometers farther forward or the Combat Trains had been located off the prime enemy avenue of approach? For the S2, what if the counterrecce plan had included more aggressive patrolling of the hillside where the threat Division Reconnaissance Team (DRT) established a critical OP? Intensified staff training in recce-counterrecce would be enhanced by ensuring that the "your way" AAR can be expanded to permit different friendly counterrecce plans to be run against threat recce. What other expansion capabilities should be built into the simulation? Chapter 5 discusses some individual and small unit training opportunities which can be created by BCST Table and Module execution. Much more appears both desirable and feasible.

The opportunities should be even greater for small team training (grouped or distributed) drawing on the professional training potential of interactive distributed training. The challenge is to design the AAR to permit going beyond normal comparisons portraying differences in MOP between "a way" and "your way" Table execution. Now the purpose is to draw on simulation to create new training opportunities such as "mini-vignettes" which could draw on the known METT-T of the Table to engage staff teams in staff synchronization exercises requiring responsive staff work by staff officers within a unit staff (horizontal) and by staff officers charged with multiechelon coordination within and across Battlefield Operating Systems (vertical). These exercises, derivative of the Tables, are defined as Modules. Knowing what the more difficult staff team tasks are when executing a particular Table, those staff exercises (Modules) could be "canned" by the Proponent from the "a way" execution of the Table to be available to be recommended as remedial small team training after the "your way" AAR. For example, knowing that synchronization of direct and indirect fires is difficult, part of the design of the Battalion TF Defense-Execution Table could be a prepackaged exercise in coordination to synchronize direct and indirect fires prepared in advance based on the "a way" Table. When that

anticipated lack of coordination is raised in the "your way" AAR, there would be a remedial exercise (Module) immediately available to recommend for small team training.[16]

- It should be apparent that TES technologies permit substantial changes in the purpose and the process of AARs. AAR change in turn will stimulate new requirements for training support. As new capabilities are realized, new requirements develop. Now that it is possible to observe activities from any point on the entire battlefield at any time in virtual simulation, new tasks and standards seem inevitable. Much more battlefield activity can be observed and recorded. All of the analogies to the use of television in national sports coverage now apply to combat unit training. Instant Replay and Fast Forward seem to offer promise as the dominant training support. The opportunity to "what if" alternative staff recommendations and actions is a very powerful training tool, as is the opportunity to accelerate time to see differential outcomes. These applications, albeit powerful, are not remarkable. They respond to logical requirements embedded in traditional unit staff training. It is different, however, with vertical training when events occurring on different planning cycles and response times need to be brought together in time to permit the AAR. Vertical BCST promises to produce entirely new training support requirements.

16 Alternatives for individual staff officer and small staff team training are discussed at greater depth in Chapter 5.

APPENDIX 2.1--ENCLOSURE
BATTLE STAFF INTEGRATION[1]

Olmstead's study of the battle staff team as a unified integrated system is central to the development of the Staff Task Proficiency-Battle Staff Effectiveness model proposed in this Paper. For that reason, the Executive Summary of his effort is reproduced in its entirety[2].

> The subject of this paper is organizational effectiveness and, more specifically, some important human factors that contribute to the combat effectiveness of large military organizations. These particular human factors are centered in the collective and integrated judgments and actions of key unit personnel who comprise "the battle staff," the command and control personnel within a unit. The competence of a battle staff in performing its essential functions as a unified, integrated system can be a major determinant of combat effectiveness. Today, there is mounting evidence that maximum effectiveness can be achieved only when a battle staff addresses directly the quality of its organizational functioning and develops capabilities that will enable it to maintain functional integrity under the stress of battlefield pressures.
>
> This paper sets forth a sound, research-based conceptual framework for understanding and addressing battle staff functioning and its relationship to the effectiveness of combat organizations; it also provides practitioners (military leaders, trainers, and performance analysts) with concrete guidance for implementing the concepts so as to develop and direct effective battle staffs.

A. DESCRIPTION OF THE BATTLE STAFF

The modern battlefield is characterized by:

(1) Extreme rapidity of critical events.

(2) High levels of turbulence.

1 Joseph A. Olmstead, *Battle Staff Integration*, IDA Paper P-2560, February 1992, pp. S1-6.

2 Note that development of individual staff officer tactical and technical competence is assumed to be necessary but is not presented as a pacing problem in Olmstead's work. Recent research by ARI Benning portrays substantial problems in staff officer proficiency in a limited sample of AC units. This work is cited in App. 6.1. Chapter 5 addresses individual and small staff team proficiency in detail.

(3) Increasingly unpredictable combat environments.

(4) Increasingly complex combat operations.

To be effective under such conditions, combat units must possess organizational capabilities to:

(1) Search out, accurately identify, and correctly interpret the properties of operational situations as they develop.

(2) Solve problems as they occur within the context of rapidly changing situational demands.

(3) Generate flexible decisions relevant to changing situations.

(4) Cope with shifting situational demands with precise appropriateness.

Members of the battle staff perform all functions needed to provide direction to the unit and to maintain unit activities at high levels of effectiveness. The interaction whereby information, decisions, and actions are brought into conjunction involves a complex interplay between levels in the chain of command. The constant interplay that occurs is the essence of organizational functioning.

B. BATTLE STAFF FUNCTIONS AND INTEGRATION

The discussion of the battle staff functioning and integration begins with a survey of the organizational literature and the theories and concepts relevant to military organizations. An open system approach to military units is found to be the most practicable approach for understanding and improving battle staff performance. According to open systems theory, an organization is an adaptive, equilibrium-seeking, open system, and the processes through which adaptation occurs are significant subjects for attention.

Battle staff integration . . closely related to, if not identical with, "teamwork." Accordingly, it seems most practicable to develop an approach to battle staff integration within the context of teamwork. A unique feature of the battle staff as a team is that, at one time or another and to some degree, any and all of its functions may be performed by one or every member, either individually or collectively. Integration occurs when members are committed and hold shared values and common norms about the performance of their respective roles.

Requirements for effective battle staff functioning include the following:

(1) Role-Specific Individual Skills--the skills required to perform those activities, specific to the respective battle staff roles and which are performed independently of other team members. Although an element of all battle staff role definitions, coordinative skills are not "individual skills."

(2) Team-Performance Skills--the skills needed to execute activities/actions that are performed in response to the actions of other team members or that guide/cue the actions of other team members. Although they are the skills of individual members, they contribute to the performance of

team functions. In effect, these are the skills of coordination. They are skills that must be performed by the several battle staff members to ensure that everyone is kept informed and that all activities mesh efficiently. Included are skills required to execute the various processes subsumed under organizational competence.

(3) Integration--the force which melds the roles, attitudes, and activities of battle staff members. Integration refers to the cohesion of the battle staff as a group. Cohesion produces a coincidence of the psychological fields of members. This shared perspective is "battle staff integration."

C. OPERATIONAL MODELS FOR AN EFFECTIVE BATTLE STAFF

Two models are presented that compose an operational framework for developing effective battle staffs, an operational model for Organizational Competence and a model for Battle Staff Integration.

The essential processes, or functions, of Organizational Competence are:

(1) Sensing--the acquisition of information concerning critical environments, both external and internal, which are significant for the effective accomplishment of objectives; (2) Communicating information sensed; (3) Decisionmaking; (4) Stabilizing--taking action to adjust internal operations to maintain stability and functional integration within the unit; (5) Communicating (requirements for) implementation; (6) Coping actions--execution of required actions; (7) Feedback--assessing the effects of prior actions through further sensing.

The essence of Competence is quality--how well the processes are performed. Thus, Organizational Competence is the quality of performance of a unit's command and control system.

Battle staff integration should occur (1) when organizational conditions are conducive to cohesion and teamwork, and (2) if developmental activities within the unit are designed to propagate high skill levels, stable team norms, and strong values for teamwork.

Necessary Organizational Conditions include (1) a clear role system, (2) common superordinate goals, (3) a system of rewards for teamwork, and (4) a stable and efficient organizational system. Necessary Developmental Activities include (1) cognitive role training (individual), (2) battle staff experiential training (team), (3) unit operational training, and (4) shared success experiences.

Organizational conditions conducive to teamwork and cohesion are products of the organization and its leaders. When necessary developmental activities are conducted within an organizational context characterized by the above conditions, it can be expected that battle staff integration will be maximized.

D. IMPLICATIONS OF IMPLEMENTING THE MODELS

The implications of implementing Organizational Competence and Battle Staff Integration are many.

The development of Competence within a battle staff can be expected to result in (a) a more smoothly functioning command and control system; (b) adjustment of the unit to changes in the tactical environment with a minimum of error, lost motion, or wasted effort; and (c) maintenance of higher levels of unit effectiveness under the pressures of combat.

Unit effectiveness can be enhanced by improved Competence and Integration through the following:

(1) Organizational Analyses

(2) Organizational Design

(3) Training and Development.

With respect to organizational analyses, the concepts subsumed under Organizational Competence offer potential for diagnosis of organizational functioning and for the correction of dysfunctional aspects.

With reference to organizational design, the way in which an organization is structured and roles are defined can have far-reaching implications for process performance. This is especially true for combined arms task forces and other task forces that may be uniquely designed for special missions or purposes.

For training and development, the central issue involves how well the processes are executed and how they are coordinated to produce integrated battle staff and organizational performance.

The development of Competence should begin with training in conceptual analyses of Competence and its components, accompanied by cognitive skill training in controlled classroom settings. Following cognitive skill training, experiential training is the technique of choice. Here, methods such as role playing and simulation can provide opportunities for personnel to vividly experience the results of their actions upon other battle staff members as well as upon the outcomes of exercises.

Implications for leaders are also addressed. Whether a battle staff will develop into an integrated team, with the Competence needed to make it effective, will depend largely on the nature of the leadership available to it. Successful leadership will develop a battle staff capable of dealing effectively with a range of operational problems and, in addition, encourage the growth of a team that can integrate diverse elements into a unified system. In short, a principal requirement for battle staff leaders is to create organizational conditions that are conducive to effective performance. In general, the commander's goals in developing a battle staff should be the transmission of knowledge, the inculcation of skills, and the cultivation of teamwork. This involves training battle staff members in their respective role requirements, while teaching them to concentrate on solving mutual problems rather than merely protecting private jurisdictions.

The effectiveness of a battle staff is determined by:

(1) The skills of each member in performing, both individually and collectively, the various organizational processes dictated by operational and task demands, and

(2) Battle staff integration--the extent to which the roles, perceptions, motivations, and activities of all battle staff members are melded into a unified whole.

The ultimate pay-off in battle staff competence, integration, and effectiveness can be achieved only through experience and practice in performing together as a team under conditions that are most conducive to learning.

It is important to note that Integration alone will not produce effectiveness. It only supports and sustains Competence, which is qualitative proficiency in the performance of critical organizational functions. On the other hand, Competence without Integration can be a very tenuous attribute, subject to dissolution by all of the tensions and pressures that may arise from highly turbulent and stressful environmental conditions. Both Competence and Integration are essential for maximum organizational effectiveness.

E. CONCLUSIONS

A battle staff is a role system, driven and controlled by operational (task) demands and maintained by shared values and norms. The "roles" of the system are the official positions occupied by members of the battle staff, together with both the formal duties and informal expectations associated with each position. Integration is the melding of the activities of members through norms and values shared by members of the battle staff.

Battle staffs function in highly "emergent" situations of the modern battlefield. This functioning requires at least the following:

(1) Role-Specific Individual Skills

(2) Team Performance Skills

(3) Integration.

Both Role-Specific Individual Skills and Team Performance Skills are trainable and are susceptible to improvement through exposure to formal individual and team training programs. On the other hand, Integration is an attribute of a team, and when present in appropriate amounts, it enhances unity within the system and focuses individual and team skills upon the task requirements of the system. Under current world conditions, the survival of an organization, whether military or civilian, requires fine sensitivity to the often subtle cues that presage change, the ability to read such cues promptly and interpret them accurately, and the capacity for rapid but efficient modification of internal operations so that new developments can be met and mastered--as they arise. Inadequacy in these capabilities can result in failure or even destruction of the organization.

APPENDIX 2.2

TASKS FOR BATTLE COMMAND STAFF TRAINING

APPENDIX 2.2
TASKS FOR BATTLE COMMAND STAFF TRAINING

Selection of tasks for BCST is a real challenge. There has not been the same training development of staff tasks as there has been for individual and collective task training in small units. This should not be surprising. Good Platoons and Companies are the strength of any army; improvement there should be first priority. It was and they reflect it. The Platoon and Company ARTEP-MTP for maneuver units demonstrates rigorous thought as to what the individual task should be at each Skill Level for the Enlisted Force. Then considerable effort was devoted to matching skill proficiencies at each level with the collective task requirements for winning tactical mission proficiency at Platoon and Company. This all was exceedingly well done. Unfortunately, the same attention was not devoted to the preparation of battalion staffs. Some task lists and training programs have been developed but not as an integrated effort. It is fair to assert that more, much more, time and effort have been expended on training enlisted Dragon gunners than on training primary staff officers in the detailed execution of their job tasks. There has been virtually no training development for small staff teams such as the S2, S3, FSO. This is all in the process of change due largely to excellent Training Effectiveness Analysis of staff training at the Combat Training Centers. But there is little available today.

An approach was required both for both task development and the staff training strategy itself. The purpose of this Appendix is to describe the approach taken for task development for Staff Task Proficiency, individual and small team tactical and technical competence. Detailed tasks are discussed in App. 2.3, MOP/MOE Development.

Several training development approaches were considered initially.

Alternative A: Review and use or conduct front end analyses of individual and team competencies required including BOS functional (vertical and horizontal) and Battle Staff Effectiveness proficiencies. The challenge is to select tasks from work done by the training development process in TRADOC (SM, ARTEP-MTP) and individual ARI Field Units, then build the Tables to train these tasks to proficiency.

Alternative B: There is an alternative to building Tables by aggregating individual tasks. This alternative is enabled by virtual simulation, which permits learning while "warfighting." The alternative is to "build" from back (AAR) to front (Table) by ensuring that the appropriate MOE/MOP reflecting important tasks are included in the AAR. Then design the Tables to train to the AAR. Essential task proficiency should "fall out".

Alternative C: A combination of the above. Conducting "warfighting" in simulation drawing heavily on experiential data developed at the CTC such as the ARI-POM Combined Arms Battle Tasks to build from back to front.

Alternative C was selected as the approach because it advantaged the new capabilities of virtual and constructive simulation and partially compensated for scanty staff training development. The development focus became entirely one of disaggregating desirable outcomes rather than building from "eaches" in the intent that the whole would be at least equal if not more than the sum of the individual task "parts."

The next challenge was to structure the broad framework for the objective AAR since the AAR was determined to be "critical path" for creating BCST. Specific development steps--planned and subsequently executed--were:

- Determine the Staff Task Proficiency--Battalion (horizontal) and BOS (vertical) tasks--and Battle Staff Effectiveness tasks to be trained. Candidate sources are: the ARTEP 71-2 MTP for the heavy Battalion Task Force, ARI POM (Combined Arms Battle Tasks), and ARI Leavenworth (ACCES) staff coordination tasks.
- Develop the Measures of Performance (MOP) and Measures of Effectiveness (MOE) associated with the Tasks--both horizontal and vertical. This will be an iterative process drawing on the Ft. Leavenworth tactical command course task lists, ARI expertise, and Proponent experience. After broad MOP/MOE are stated, highly detailed MOP and MOE can be related specifically to execution of a "school solution" or "a way" "warfight" or Table structured to ensure that the desired MOP/MOE are created.
- Design the AAR for Unit Training Assembly (UTA) length Basic Coordination Tables both vertical and horizontal.

While development could not await a new comprehensive detailed front end analysis, there was a need to start with a task list--as a "checklist" for overall AAR development. Several general (not staff specific) task lists are available:

- The baseline source for Battalion development is the ARTEP 71-2-MTP, *Mission Training Plan for The Tank and Mechanized Infantry Battalion Task*

Force, October 1988. This document is based on extensive research within TRADOC, including extensive observation at the CTC, particularly the National Training Center. The source data are now some five years old. This is an excellent document but it is difficult to establish linkages from task to task in mission execution. There is no structured sequencing or linking of tasks nor were there ties to organizational effectiveness-Battle Staff Effectiveness. Many of these shortcomings were corrected in an ARI effort to draw on experience at the Combat Training Centers, specifically the NTC.

- An ongoing assessment process of CTC-NTC training was established at ARI-POM under the supervision of the trainers at Ft. Leavenworth (CAC-T) with a General Officer Steering Committee. A major product of this assessment process is the formulation of Combined Arms Battle Tasks. These Battle Tasks are in the process of publication in mid 1992. The following description is extracted from the Combined Arms Battle Tasks-Battalion Task Force-Defend:

Combined Arms Battle Tasks

...battle tasks are organized by Battlefield Operating Systems (command and control, intelligence, maneuver, fire support, air defense, engineering, and combat service support) within the battle flow framework of plan, prepare, execute. This book contains critical combined arms battle tasks that contribute to mission accomplishment.

The methodology used to identify these battle tasks was based on an extensive collective front-end analysis which drew on doctrinally identified activities as a starting point. Additional task lists were developed by military SMEs at the NTC, the Combined Arms Center-Training (CAC-TNG), the Infantry and Armor Schools, and selected FORSCOM units. These lists were then carefully merged, reviewed, and refined by military SMEs. The product of that effort became the series of combined arms battle task books.

Organization

Fifteen mission books were developed reflecting the three echelons and five mission types. These books are organized into a battle flow framework which identifies mission phases, segments, and tasks, each with a specific purpose and observable outcome.

Phases

The battle flow framework delineates three phases - planning, preparation, and execution--that correspond to the flow of a specific mission. A fourth phase--common--represents those activities which are continuous throughout the mission. The planning phase begins when the unit receives a mission warning order from its higher headquarters and ends with the presentation of the unit Operation Order. The preparation phase begins following the OPORD and continues until movement from the assembly

area starts. The execution phase is initiated when the attacking force begins movement forward from the assembly area and continues until a new mission is given the unit.

Segments

The phases of planning, preparation, and execution are further subdivided into nine supplementary segments, each defined by a purpose and objective. This was done to facilitate the organization of like and supporting activities which occur in a generally sequential fashion through each mission. These segments are stated below.

The planning phase has four segments:

Conception--understanding the assigned mission;

Analysis--initial Battlefield Operating System planning and identification of resources;

Integration--the coordination of all available resources into a single package; and

Order--presentation of the complete plan to subordinates.

The preparation phase has two simultaneous segments:

Readiness--the physical preparation of personnel, equipment, and weapons for combat;

Supervision--the leaders efforts to confirm combat readiness.

The execution phase consists of three sequential segments which are determined by the attacking force:

Movement--movement from the assembly area to the Line of Departure;

Maneuver--movement forward of the Line of Departure;

Objective--actions within the objective area.

Conditions

Mission specific conditions were developed for each phase segment. Since the mission drives the application of individual tasks and the accomplishment of those tasks must occur to meet mission requirements, it was necessary to develop conditions within the battle flow framework. For example, the task of Issue an Operations Order must be timely, complete, and address the mission, but is issued without regard to surrounding terrain. Phase segments became the organizational level at which conditions were constructed because of their clear functional definition which provided the structural foundation for task clusters.

Battle Task

The critical activities that must be accomplished to ensure mission success are identified as battle tasks. In this document they have been structured and organized to provide maximum training utility.

Standards

Battle tasks are specific activities that must be conducted to ensure mission success. Each task is composed of an overall task standard and subordinate observable standards. In cases where the task is sufficiently complex, subtasks are included with specific standards. The overall task standard is stated in terms of the desired outcome. Subordinate observable standards provide specific criteria which must occur for the standard to be met.

Sequencing

Battle tasks are sequentially organized within the battle flow framework. In the planning phase, for example, the tasks generally follow the steps outlined in the standard Army Troop Leading Procedure. Logically, the task Issue the Warning Order must occur before the task Issue the Operation Order. In addition, some tasks are done at the same time, such as Issue the Operations Order and Graphically Illustrate the Scheme of Maneuver. Other tasks, such as Maintain Operational Security, are conducted continuously and were placed in the common phase in accordance with their ongoing nature. All the mission battle tasks for each mission were sequenced in this manner.

Linkages

Task linkages were constructed in a fashion similar to an electronic circuit board to illustrate functional relationships between activities. In the planning phase, this structure demonstrates the integrating network between tasks, while in the execution phase it shows the synchronization necessary for mission success. In doing so, it provides a clear picture of the interactive and supporting nature of all the battle tasks throughout the mission.

Synchronization

The task linkage structure serves as the synchronizing framework for all battle tasks in a mission. Not only are these tasks interactive at a specific echelon and mission, but this linkage also enables the tasks to be tied to higher and lower echelon activities, as well as specific functional areas such as mortars. Finally, battle tasks can be cross-walked with other appropriate training documents, such as Mission Training Plan (MTP) tasks, to provide additional focus to unit section training.

- A third alternative for focusing the AAR was use of the ACCES methodology developed by ARI Leavenworth. While ACCES provides clearly useful ways to assess battle staff command and control such as an excellent checklist and evaluation methodology for reviewing information flow to and from the Division Staff, ACCES is wholly process-oriented. For a more complete description of ACCES, see Enclosure 1. Tactical Engagement Simulation (TES) virtual simulation applied at the brigade and battalion echelons permits training and evaluation to specific desired battle outcomes. Success or failure in executing battle tasks is evident. To be credible with the user, and to advantage the technology of TES, the primary MOE/MOP should be

achievement of explicit tasks across the Battlefield Operating Systems. Thus, while ACCES seems clearly useful as a command and control measurement system, particularly at division and above, it is not suited as a task inventory for horizontal and vertical BCST across all seven BOS.

Therefore I select the Combined Arms Battle Tasks supplemented where appropriate by ARTEP 71-2-MTP as the task list for design of the AAR. ACCES methodologies will be useful for assessing Battle Staff Effectiveness, particularly organizational competencies as defined by Olmstead.

There is one remaining potential conflict in approaches. That relates to the overall organization of the BCST process. ARI Leavenworth sees many battle staffs overly focused on the traditional staff planning process to the detriment of other equally important coincident responsibilities of monitoring and directing. The new draft FM 101-5 addresses planning, monitoring and directing--often simultaneously. Multiple virtually simultaneous missions are certain to remain characteristic of the Airland Battle battlefield. The ARI POM Combined Arms Battle Tasks divide BCST into Planning, Preparing and Executing in sequence-phases "... that correspond to the flow of a specific mission." This method is particularly useful for training the employment and synchronization of BOS. Both address the range of tasks necessary to be mastered for successful BCST. I suspect any difference in approach may be grounded in the ARI-POM focus on the NTC where for very valid reasons there is a sequential presentation of unit missions separated by AAR. Both ARI Leavenworth and ARI POM are correct. BCST AAR for training development should require both simultaneous and sequential unit missions. Monitoring, Planning, and Directing of multiple missions will be required while the Plan, Prepare, and Execute sequence of individual missions is under way.[1]

The path for development of horizontal BCST at Battalion is clear. The Combined Arms Battle Tasks are a reasonable and authoritative framework for developing the MOP and MOE for BCST AARs. And the majority of these tasks can be trained in SIMNET. All tasks can be trained if several product improvements are made to existing SIMNET. See Inclosure 2 Combined Arms Battle Task Training in SIMNET. Product improvements

1 TCDC is concerned that BCST training for multiple missions below Division echelon is not possible. Staffs are too thin. Ltr, Col. Daniel E. Butler to Author, 3 September 1992. This is not an either/or issue. Clearly Plan, Prepare, Execute must be mastered first at the Brigade/Battalion echelons. Then training should continue so the unit staff can handle multiple missions characteristic of Airland Battle particularly at Brigade and above. The Concept Based Requirements System should stimulate review of this issue in the CTC. The organizational staff structure could be increased; the tempo of doctrine reduced, etc.

in Manned and IFOR(SAFOR) capability would be best. MCC (AFOR) additions will permit appropriate training to occur. See Enclosure Combined Arms Battle Task Training in SIMNET. Although Brigade Task Force BCST is more complex than BCST at Battalion, the methodology outlined above should transfer. More complex combined arms tasks will be required at Brigade. They should evolve as CTC focus rises from Battalion to Brigade.

The approach is less clear for the vertical BCST. There appear to be few good layouts of vertical BOS requirements. Intelligence has a useful unit intelligence assessment methodology prepared by ARI Huachuca. Fire Support has the Fire Coordination Exercise which is useful as an initial task structure. Both of these can be expanded initially as an adjunct to Battalion horizontal BCST. This is discussed in a separate paper: Vertical BCST-Fire Support General Principles, App. 1.3.

The last step is to consider training of Staff Task Proficiency--individual staff tasks (S-3, S-2, etc.) and the small team tasks (such as S-3, S-2 coordinating an effective Reconnaissance and Surveillance Plan) as well as the Battle Staff Effectiveness tasks--Organizational Competence: sensing, communicating information, decision making, stabilizing communicating implementation, coping actions and feedback.[2] Recalling that the basic decision in selecting Alternative C above was to focus on working back from warfighting tasks developed as "part and parcel" from the AAR, existing training documentation appears to be sufficient:

- Individual Staff Officer Tasks are listed primarily but not exclusively in the Planning segment of the Battle Flow Framework in the ARI-POM Combined Arms Battle Tasks. These tasks are supplemented by specific staff position tasks in the Mission Training Plan 71-2. For example, see "Perform S3 operations" (Task 7-1-3902). The subtasks and standards are quite specific. For example:

"3. S3 section collects information and updates estimate.

a. Estimate is correct and current, and contains friendly status impacting on the operation from--

- Brigade--higher situation.
- Combat trains--combat status of battalion.
- Fire support status.

2 Olmstead, Joseph A., *Battle Staff Integration*, IDA Paper P-2560, February 1992, p. V-3.

- Supporting CS elements--combat status.
- Adjacent, forward, and supporting combat units--overall situation and status.
- S2 provides enemy, terrain, and weather information.

b. Estimate is initially updated within 15 minutes and completed before the Commander's war gaming.[3]"

- Small Team Tasks are suggested primarily in the Combined Arms Battle Tasks which specify the coordination which must occur cross BOS in Planning, Preparation, and Execution to warfighting success. These tasks have to be accomplished in order for the commander's plan to be successful. Success or failure in performance of these tasks will fall out of the AAR process provided the MOP/MOE are sufficiently detailed.
- Battle Staff Effectiveness processes are defined and suitable documentation provided for further training development work in Olmstead's work. For example, the following are provided as an initial Process Assessment worksheet:

"SENSING

1. All information that might have been available to the organization was obtained by it.
2. Attempts to obtain information were relevant and effective.
3. Correct interpretation was placed upon information that was obtained.
4. In view of the information available to the organization, correct assessments were made.
5. Acquired information was processed, integrated, recorded and stored so as to have maximum utility."[4]

These are clearly more general than is preferable but they do provide a solid rationale for future development just as the Combined Arms Battle Tasks and ARTEP-MTP tasks provide. In addition, the organizational competencies criteria can now be reinforced by the MOP developed in the ACCES methodology developed for the division-echelon Battle Command Training Program (BCTP).

There appears to be sufficient existent Staff Task Proficiency and Battle Staff Effectiveness task analysis to assess the completeness of BCST training resulting from

3 ARTEP 71-2 MTP, *Mission Training Plan for The Tank and Mechanized Infantry Battalion Task Force*, October 1988, p. 5-92.

4 Olmstead, p. D-3. Similar criteria are provided for other unit organizational competence measures. A scale of numerical values is also suggested.

AAR and Table development advantaging the use of detailed performance-oricnted MOE and MOP--Alternative C. In other words, there is sufficient task analysis to act as a checklist to ensure that development from AAR back to Table does not omit an important training requirement. It is rational to proceed. The next task is to define the MOP/MOE for AAR development.

Enclosures: 1. Army Command and Control Evaluation System

2. Combined Arms Battle Task Training in SIMNET

APPENDIX 2.2--ENCLOSURE 1
ARMY COMMAND AND CONTROL EVALUATION SYSTEM[1]

OVERVIEW

Introduction

This report provides an overview of the Army Command and Control Evaluation System (ACCES) theory and methodology. ACCES was initially developed by Defense Systems, Inc. (DSI), in the period October 1986 to January 1990 under the direction of the Fort Leavenworth, Kansas, Field Unit of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). In April, 1990, ARI awarded a follow-up contract to Evidence Based Research, Inc., for specific required enhancements to the ACCES system. This report provides a description of ACCES Version 91.3, and is current as of the end of December 1991. Continued refinement to the ACCES model of command and control, data collection methods, and data analysis procedures may be expected for the next several years.

Background

MACOM commanders and the Training and Doctrine Command (TRADOC), through the Battle Command Training Program and the Support to Exercise Program, provide frequent opportunities for brigade, division, and corps staffs to train in Command Post Exercises (CPXs) and Field Training Exercises (FTXs). The commanders and staffs are exposed to varying environments and situations and are given the opportunity to practice and hone their ability to function as effective command and control (C2) systems. The Operational Test and Evaluation Command (OJJI~C) is frequently called on to evaluate C2 materiel systems. Less formal system evaluations are conducted throughout C2 systems' life-cycles by agencies such as the Future Battle Laboratory, Fort Leavenworth, Kansas, and the ATCCS Experimentation Site, Fort Lewis, Washington.

Both training and test and evaluation exercises require some measure(s) of system performance. In the training environment, exercises provide little benefit unless participants are provided feedback on their performance. In the test and evaluation environment, measures and criteria of system success or failure are obviously critical. However, while measures have been developed which address the efficiency of selected aspects of C2 performance (e.g., throughput rates for certain types of messages within certain communication systems), there is no accepted overall measure of C2 effectiveness (See Crumley, 1989, for a complete review of C2 measurement alternatives).

1 Stanley M. Halpin, *Army Command and Control Evaluation System (ACCES): A Brief Description*, ARI Working Paper LVN 92-01, 6 January 1992, pp. 1-3.

Under the sponsorship of the Combined Arms Command--Combat Development (CAC CD), ARI has taken steps to address this need for C2 measurement through the development of ACCES, a measurement system to evaluate the effectiveness of C2 at various levels. ACCES differs from traditional force effectiveness measures (e.g., force loss ratios) which address the headquarters primarily in terms of its subordinates' efforts. In contrast, ACCES is based on the premise that C2 effectiveness may be defined as the effectiveness of a headquarters staff; in this view, C2 effectiveness measurement requires an understanding of the processes that are performed by the staff to facilitate the performance of subordinate elements. Thus, we need a means to measure quantitatively how well the critical staff processes are performed. The ACCES methodology has been evolving over the last several years. During that period ACCES has provided the framework for data collection and analysis at twelve division training exercises and one corps training exercise. During or after many of these exercises the unit commanders and their principal staff were provided feedback on their C2 effectiveness based on the ACCES observations and measures. While no one will claim that ACCES is the ultimate system which captures all aspects of C2 effectiveness, there has been general agreement that the ACCES approach is providing valuable evaluative and diagnostic information in support of C2 training. Current follow-on developmental efforts are under way to modify ACCES measures in order to bring them more in line with doctrinal tasks and standards and to refine the data collection and analysis procedures in order to provide more accurate and complete feedback during and after a several day training exercise. A cooperative effort with OPTEC is exploring the application of ACCES to the evaluation of the Army Tactical Command and Control System (ATCCS).

ACCES in a Training Environment

Despite the word "evaluation" in the label "Army Command and Control Evaluation System," it must be emphasized that ACCES does not provide a rating of C2 effectiveness; i.e., ACCES does not grade a division HQ as having passed or failed against some set of criteria. Rather, ACCES provides indicators of C2 effectiveness. It is precisely these indicators which are of value to a commander during and after a CPX. A major strength of the Army's Battle Command Training Program (BCTP) is the quality and quantity of feedback provided to the training audience by BCTP personnel. ACCES indicators would provide additional detail and a different perspective on C2 effectiveness than currently provided by BCTP. Unfortunately, one of the strengths of ACCES, the ability to draw from behaviors occurring in different locations at different times, also is a weakness of the system when applied in a training environment with its requirement for rapid feedback. A major focus of current ACCES development efforts is the exploration of means to simplify ACCES data collection and analysis procedures and techniques so as to reduce the time required to provide substantive feedback to the unit being observed.

ACCES in a Test and Evaluation Environment

In the typical test of a materiel system, the goal is to evaluate the system against system requirements which specify performance objectives or standards. However, there are few if any accepted performance objectives or standards for C2 systems. We believe that the key to C2 test and evaluation is the use of a stable baseline of system performance data which can be used for comparison. Rather than defining *a priori* standards of "successful" C2 system performance, we argue that the most appropriate evaluation strategy is one which compares the new system to the old. ACCES measures are targeted to critical C2

system performance characteristics, and a collection of ACCES measures across several units can provide a stable baseline for such comparisons.

There are at least two types of C2 system evaluation which could utilize ACCES. One target would be the examination of the effectiveness of the overall C2 system in a test unit which is trying out a change in the C2 system itself (e.g., a unit using a new command post structure, or one using a new computer-based system). A second target would be the examination of the effectiveness of the overall C2 system in a test unit which is trying out some change in one of the supporting systems. The argument here is that while a subsystem like Intelligence or Fire Support should be evaluated in its own right to determine whether it is reliable, usable, etc., it is also necessary to determine whether that subsystem provides any value-added to the overall C2 system in the context of the overall Army Tactical Command and Control System (ATCCS). In both types of C2 test and evaluation, the use of a stable ACCES baseline can be used for comparison to establish the incremental changes in C2 system performance during the test.

The continued evolution of ACCES has made it difficult to establish a stable baseline. The ACCES (version 91.3) which is described in this paper is the latest in a series stretching back five years. Each of the "versions" of ACCES has differed in some significant respects from prior and subsequent versions; we have evolved the ACCES model of command and control, we have changed the focus of our measurement, and we have changed our data collector training procedures (and hence have changed the way data are collected and analyzed). ...These improvements have been at the expense of creating a stable baseline of similar data elements similarly collected under similar conditions from similar units. However, some communalities can be identified, and two reports currently in preparation will summarize, respectively, lessons learned in six early ACCES applications and in four 1991 applications (using ACCES versions 91.1 and 91.2). A new project of the Fort Leavenworth Field Unit beginning in 1992 will examine in more detail the steps which the Army needs to take in order to create a stable database of C2 performance data which can be used not only for test and evaluation comparisons, but also as a basis for training feedback and for identification and analysis of doctrinal deficiencies and lessons learned....

ACCES Model of C2

As we begin to examine the conceptual model of C2 which provides the context for other elements of ACCES, it is important to define what we include in our use of the term "C2." We view command and control as an observable behavioral process. People command, and people control. The headquarters elements of a unit (e.g., the division Main Command Post, brigade Tactical Command Post, etc.) are comprised of people whose primary function is to provide the command and control outputs which serve to structure and guide the actions of subordinate units. Those people work within constraints established by tradition, doctrine, training, and experience. They are supported by, and further constrained by, various C2 systems which function to gather, manipulate, and transmit information within and among headquarters. The ACCES conceptual model of C2 assumes that the headquarters of a unit, the groups of people who do command and control combined with their supporting information systems, may themselves be viewed as a "system." This headquarters "system," i.e., the overall C2 system, establishes goals and objectives for subordinate units (based on goals and objectives provided by the senior unit), within an environment characterized by a great deal of uncertainty. This overall C2 system actively obtains information about the environment, reviews that information to determine whether the goals and objectives are achievable, and periodically generates new

outputs in the form of new or revised goals and objectives for subordinate units. In simplest terms this "adaptive control system" seeks to achieve a balance between the desired and actual state within its environment by monitoring the state of the environment and making any necessary changes in the actions of the elements it controls.

The overall effectiveness of the C2 system, the headquarters of a unit, can be judged by the viability of their outputs, and the critical outputs are the "plans" and related directives which establish the goals and objectives for subordinate units. Good plans can be executed without need for modification beyond the contingencies built into them and remain in effect throughout their intended life. Alternatively, a headquarters may find that its plans (in decreasing order of effectiveness): require minor adjustment in the course of their execution, without change to the basic plan; require execution of a contingency, significantly different from the intended course of action, but provided for in the initial plan; or require cancellation and issuance of an entire new plan.

This conceptual model of C2 was used to guide the development of measures of the C2 process within the progenitor of ACCES, the Headquarters Effectiveness Assessment Tool (HEAT); see Crumley, 1990, for a detailed discussion of HEAT and alternative models of C2. Measures were developed by asking what observables could provide some insight on the functioning of such an adaptive control system. The focus in HEAT and, more recently, in ACCES has been on the primary C2 outputs of the headquarters, plans and directives, and on the information which provides the headquarters with an understanding of the environment.

The overall ACCES measures of C2 system effectiveness address primarily the extent to which plans remain in effect for their intended period, without the need for unanticipated changes in the plan. "Effective" headquarters are those which: (a) develop stable plans (presumably based on very accurate and insightful analyses of current and likely future status); (b) issue directives concerning missions, assets, schedules, and boundaries which are successfully executed without change; and/or (c) issue directives which permit flexible responses in rapidly developing situations (contingency planning).

ACCES also provides diagnostic measures of the quality of processes by which C2 system functions are performed. An exercise timeline and its associated C2 cycles are used in ACCES as the framework to describe the information transformation processes engaged in by a staff and the decision maker, from the acquisition of data to the issuance of plans and directives. ACCES also looks at the performance of individual functional cells and the interactions between the cells. The general approach, as illustrated in Figure 1, is built around the following concepts:

- The "environment" within which this adaptive coping process is attempting to maintain control consists of subordinate and higher headquarters, plus the elements of METT-T (Mission, Enemy, Troops, Terrain, and Time).
- The staff is understood to engage in a number of actions in order to support decision making and its implementation:

 Collecting information through monitoring the environment and receiving reports,

 Synthesizing information,

 Developing and evaluating alternatives,

 Reviewing recommended courses of action,

Planning implementation,

Reporting,

Coordinating,

Inquiring (seeking information), and

Disseminating information in messages and reports

- A full C2 cycle in ACCES begins with the receipt of information about the environment, and continues with evaluation of the status of the situation vis à vis the current plan, recognition of a need for change(s) in the plan, exploration of alternatives, a decision on change(s), and detailed plan development, and concludes with preparation and issuance of a directive.
- ACCES C2 cycles will not always involve all of the above steps; for example, the exploration of alternatives and detailed plan development may both be by-passed under conditions of very high stress (severe time pressure while trying to address a crisis) or very low stress (confirmation that it is time to execute a pre-planned branch or sequel to the current plan).
- The actions of the staff, outlined above, yield a series of products which are observable elements of the ACCES C2 cycles:
 - Information about the environment,
 - An initial understanding of the situation,
 - The estimate of the situation, including a set of alternative actions, their expected results, and consequent recommendations,
 - Decisions by the Commander (or in some cases the staff, acting for the Commander),
 - Inquiries (for information),
 - Reports that inform others, including answers to incoming queries,
 - Command guidance, and
 - Plans and directives.

The concepts upon which ACCES is built assume that effective staffs look ahead in time and develop plans that are robust (i.e., plans that will support mission accomplishment despite changes in the elements of METT-T). ACCES v. 91-3 ...includes 49 primary measures of performance; of these, six of the measures deal with the planning process as a whole and the remainder are descriptive measures which focus on the process steps separately. An additional 178 subordinate measures provide a rich source of additional diagnostic information for an analyst examining a particular exercise. Two additional categories of measures are also developed in ACCES. ...lists the six descriptive "measures" of the decision context: for example, for each decision recorded, who made the decision? What unit(s) is/are affected? ...lists 17 primary and 18 subordinate descriptive "measures" of the exercise and scenario; these elements of ACCES will come into use as we begin to aggregate and compare data across different exercises.

APPENDIX 2.2--ENCLOSURE 2
COMBINED ARMS BATTLE TASK TRAINING IN SIMNET

Timely extension of unit staff training on the Combined Arms Battle Tasks into Tactical Engagement Simulation (TES)-virtual simulation and in fact the development of distributed Battalion-echelon BCST itself will be governed by the utility of the current fielded SIMNET in representing the tasks to be trained to the unit in training. Training development will be relatively simple if the majority of the tasks can be trained routinely using existing simulation infrastructure, particularly SIMNET-T at Ft. Knox and the M SIMNET now operated by the National Guard. An assessment of the potential of SIMNET to train the Combined Arms Battle Tasks-Battalion Task Force-Defend follows.[1] NOTE: Three of the Combined Arms Task lists are not yet available. These missions are night attack, hasty attack, and movement to contact. From review of the other mission task lists in draft, deliberate defense appears to be a representative mission. Note that one mission, night attack, will not be doable in virtual simulation until CCTT technology is available.[2] The DARPA effort, Battle of 73 Easting, represents new capabilities in representing limited visibility and dynamic terrain but these improvements may not be available for training development research.

There are 99 Combined Arms Battle Tasks in Battalion Task Force Defend. They are further subdivided into Planning Phase: 43 tasks; Preparation Phase: 25 tasks; Execution Phase: 20 tasks; and Common (to all phases): 11 tasks.

PLANNING PHASE

Forty-one of 43 tasks can be trained on the current SIMNET (95 percent). Two tasks are only partially trainable. These two tasks can be fully trained if there is MCC (AFOR) upgrade to the current SIMNET. The tasks are:

1 Army Research Institute, *Combined Arms Battle Tasks Battalion Task Force Defend*, undated (March 1992).

2 Nor is limited visibility available as a condition for conduct of the other missions as Tables or Modules in virtual simulation until CCTT is available.

Task 34 Dispatch Quartering Party--standard: "The area is appropriately surveyed for possible NBC contamination." Need MCC NBC contamination representation.

Task 171 Establish Task Force Early Warning System-standard: "Air Defense support elements are linked into the Task Force command net." Need MCC Air Defense representation within the BnTF.

Preparation Phase: Eighteen of 25 tasks can be trained on the current SIMNET (72 percent). Of the remainder (seven tasks), six tasks can be partially trained now. Most could be fully trained if manual human "workarounds" were incorporated similar to those employed on WAREX 03/90 or if there is MCC (AFOR) upgrade to the current SIMNET. One, Task 58, requires dynamic terrain associated with Close Combat Tactical Trainer (CCTT) development for full task training even in the Command Field Exercise (CFX) mode. The tasks which are only partially trained are:

Task 48 Conduct Reconnaissance and Surveillance--standard: "S-2 ensures the following are accomplished: An R&S communications network is established and monitored by all elements." Need MCC intelligence support-GSR.

Task 56 Position Air Defense Elements--See 171 above.

Task 57 Rehearse Air Defense Plans--standard: "The Task Force Air Defense elements effectively practice the following: (1) Target Acquisition, (2) Gunnery, (3) Target Handoff, (4) Fire Control, (5) Fire Distribution." See 171 above.

Task 58 Reinforce Terrain--standard: "All protective positions are correctly constructed." Requires dynamic terrain of CCTT.

Task 59 Emplace Obstacles--standard: "Obstacles are prepared in accordance with established priorities, plans and procedures." Need MCC for mines and other obstacle effects including FASCAM.

Task 61 Report Minefield Emplacement--standard: "The initiation and completion of emplaced minefields are correctly reported and recorded." See 59 above.

Task 141 Prepare for NBC Operations--standard: "All task force elements are aware...of the location of contaminated areas." See 34 above.

EXECUTION PHASE

Thirteen of 20 tasks can be trained on the current SIMNET (65 percent). Of the remainder, all seven tasks can be partially trained now. Most could be fully trained if

manual human "workarounds" were incorporated or if there is MCC (AFOR) upgrade to the current SIMNET. The tasks which are only partially trained are:

Task 68 Conduct Reconnaissance and Surveillance Effort--standard: "Information requirements are always well understood by each of the following: (4) Assigned GSR units." See 48 above.

Task 73 Execute Fire Support Plan--standard: "Fires are always fired on the prescribed targets in accordance with designated time and/or event (4) FASCAM." Need MCC for FASCAM. See 59 above.

Task 74 Execute Obstacle Plan--standard: "Emplaced obstacles are continuously protected...." See 59 above.

Task 75 Execute FASCAM Plan--standard: "All FASCAM missions are accurately emplaced on their predesignated targets." See 59 above.

Task 77 Respond to NBC Operations--standard: "Enemy NBC attack is detected, avoided, reported, and a hasty decontamination of personnel and equipment is accomplished." The nature of the anticipated BCST training exercise (CFX rather than FTX mode of training) precludes individual vehicle execution. In addition, see 34 above.

Task 135 Control Air Defense Forces--standard: "Air defense elements are always able to effectively respond to the tactical situation and the maneuver plan." See 171 above.

Task 160 React to Enemy Air--standard: "The Air Defense Officer effectively adjusts air defense coverage as the tactical situation dictates." See 171 above.

COMMON TASKS

Eleven of 11 tasks can be trained on the current SIMNET.

SUMMARY

Eighty-four of 99 Defensive Tasks (85 percent) can be trained on the existing SIMNET; 98 of 99 (99 percent) can be trained with software additions to the existing MCC capability now used for CSS and Fire Support. Required improvements are: Air Defense unit representation, NBC contamination, mines including FASCAM and representation of obstacles in addition to soil/water, and intelligence collection (GSR). One task, Reinforce Terrain, cannot be properly represented until the CCTT is developed.

APPENDIX 2.3

MOP/MOE DEVELOPMENT

APPENDIX 2.3
MOP/MOE DEVELOPMENT

MOP/MOE are the cutting edge of BCST. They translate general statements of what needs to be done in battle into very specific practical warfighting examples tied to task, condition and standard. In addition, by virtue of the tactical resolution of TES simulation, MOP/MOE can be related to explicit replicable warfights (to "fixed" initial METT-T) which immerse the staff member or staff team in the excitement of an ongoing warfight to intensify and accelerate the BCST training process. In other words, MOP/MOE discussed in AAR are no longer abstract goals or principles. Rather they are highly specific examples of how important tasks are performed by a highly competent unit executing the same mission you will face in BCST. Or they are the practical performance standards against which you and your unit are evaluated as you train to BCST Tables.

To support understanding of the use of MOP/MOE in BCST and how it should be developed further, this Appendix describes in detail how to create the MOP/MOE and from them, the AAR for one AMTP mission for a Battalion Task Force. It will develop MOP or MOE for the S4 as a representative individual staff officer, for the S2, S3, FSO as a representative staff team and for the unit as a whole.[1] Each will be developed in combat operations in a representative tactical operation selected for detailed discussion. Then both individual staff officer and small staff team MOPs and MOEs are aggregated to create the overall MOP and MOE for the unit BCST Table.

The S4 is selected not only because of the importance of CSS to the heavy unit on the modern battlefield, but also because the tempo of CSS operations generally lags that of the other BOS. The resupply "crunch" follows the violent combat action. A critical time period for a Table stressing the integration of direct and indirect fire (30 minutes to 1 hour) will seldom stress the S4 whose real challenge begins when it is necessary to rearm, resupply and maintain after the direct fire fight is over. But results of both real time and delayed actions should be available for the unit AAR directed at execution of the mission.

[1] The TRADOC Proponent should designate the other positions requiring individual or small team training. This paper assumes that other individual staff officers are the XO, S1, S2, S3, and FSO. Another small staff team is the S1, S4 (XO).

How to design the Tables to converge performance of tasks of different BOS operating at different tempos to one AAR available shortly after completion of the Table? The S4 is only one of the staff positions which need to be documented. Similar material has to be prepared for all of the other primary staff positions and the Battalion Executive Officer. Each has different data requirements but S4 documentation seems representative.

The S2, S3, FSO are selected as the staff team for initial development because they are the most important single team in synchronizing the direct and indirect fire battle and they are the most difficult to train in peacetime when cost, safety and preservation of the ecology impair realistic "steel on target" training. The bottom line is not just excellent planning with good intentions--which is all that current staff simulations can provide--rather it is the actual round delivered on the right target at the proper location with effects desired by the commander's intent. How to train this level of staff coordination (synchronization) to distributed Guard units routinely? Then similar training development will be required for the other key staff teams.

The selected BCST Table is: Defense, Execution Phase. This is not only the "bottom line" of the defense mission, it also focuses on challenges of execution responding to swirling change on a dynamic battlefield when both staff task proficiency and overall battle staff effectiveness are necessary for mission effectiveness. At a minimum, other Tables training Bn TF Defense should address Planning and Preparation as described in the ARI-POM model. More likely, training in Bde/Bn defensive operations will include eventually multiple simultaneous operations which place increased emphasis on the Organizational Competence skills described in the Olmstead model of Battle Staff Effectiveness. For the initial layout, however, Defense, Execution Phase suffices to demonstrate the methodology

The general steps for MOP development are:

1. **Define general statements of the task, condition and established standard for the individual staff positions or the staff teams to be trained.**[2] Where the current task, condition and standard may not provide sufficient guidance as to Measures of Performance or Measures of Effectiveness, additional comments are included in italics.
2. **Describe what needs to occur in "a way" warfight to cause evaluation data required in 1 above to be developed.**

[2] Here and below, training requirements should be developed primarily from CTC or actual combat mission analyses.

3. **Fight the "a way" combat action, collect explicit MOP data related to each of the selected tasks.**

4. **Write expanded MOP oriented to the "a way" execution--if MOE, explain nature of the expert interpretation of MOP which is required.**

5. **Translate the specific "a way" MOP to the MOP collection requirements for "your way" execution of the Table or Module.**

The next development action is to develop a means to collect the MOP when a unit conducts "your way" execution of the Table. This is discussed in Appendix 2.4, AAR Training Support.

Now, to develop the MOP for the S4, the S2, S3, FSO staff team and then the battalion command staff team as a whole:

S4

STEP 1--DEFINE S4 TASKS, CONDITIONS, AND STANDARDS AS A PRIMARY STAFF OFFICER

Responsibilities of the Battalion S4 are described in doctrinal publications. General Battalion staff responsibilities are:

> The battalion is the lowest tactical echelon with a staff. Small but essential, they assist the commander in doing all those things necessary to coordinate the battle and to ensure adequate combat and combat service support to allow for continuous operations. The commander is then free to fight the battle. Supply, maintenance, communications, administration, and reporting are all supervised by the staff. The staff normally conducts much of its business in accordance with SOPs. The staff ensures continuous support to the company teams to allow them to fight the battle.

Specific responsibilities for the S4 are:

> (4) S4 (logistics officer). The S4 is responsible for all battalion logistical activities. He supervises all organic and nonorganic logistical elements supporting the task force. He is responsible for the formulation of logistical policy. He plans, coordinates, and supervises the logistical effort, to include coordinating all aspects of CSS in paragraph 4 of the task force order with the S1 and the BMO. The S4 is responsible for the arrangement, security, and movement of the combat trains, and is the OIC of the combat trains CP.
>
> FM 71-2 The Tank and Mechanized Infantry Battalion Task Force, September 1988, p. 1-8, 2-5

More explicit detail is provided in a draft doctrinal text which describes tactics and techniques:

a. S4. The S4 is the focal point of the logistical planning in the task force. It is his responsibility to tie the entire A/L network together. His primary duties and responsibilities include--

(1) Serving as OIC of battalion/task force combat trains.

(2) Serving as primary staff officer in areas of supply,transportation, and field services.

(3) Serving as logistics planner with focus on future battles.

(4) Anticipating requirements.

(5) Controlling combat trains CP operations.

(6) Monitoring the tactical situation and preparing to assume duties of the battalion/task force main CP."

p. 8-18

This detail is further elaborated in discussion of the responsibilities of the S4 Section:

c. S4 Section

(1) The S4 section requisitions and distributes supplies to company supply sections and turns in captured supplies and equipment as directed. Personnel in the sections are in the field trains and the combat trains CP. They are cross-trained with personnel of the S1 section in critical tasks to allow for continuous operations.

(2) The S4 section, supervised by the S4 and assisted by the battalion supply sergeant, is responsible for supply, transportation, and field service functions.

(3) In combat, the S4 concentrates heavily on six classes of supply: Classes I, II, III, IV, V, and VII. The support platoon leader, working with the S4 and HHC commander, coordinates requisition, receipt, preparation, and delivery of supply Classes I, III, and V. The supply section is responsible for the requisition, receipt, and delivery of Classes II, IV, and VII supplies.

(4) The S4 section and support platoon are responsible for obtaining maps. Maps are stocked by the S&S company of the main support battalion and are requested through the supply company of the FSB. The S2 is responsible for distributing maps as required. Classified maps are obtained through G2 channels.

p. 8-20

Final Draft FM 71-123, *Tactics and Techniques for Combined arms Heavy Forces: Armored Brigade, Battalion Task Force, and Company Team*, June 1991.

The doctrinal publication goes on to describe in great detail planning for combat service support including both general principles and guidance related to specific missions such as "Supporting the Defense." The discussion on Battlefield CSS Operations includes detailed review of common procedures for resupply by Class of Supply (pp. 8-27 to -30). These are explicit general doctrinal statements of Tactics, Techniques and Procedures. They provide useful general guidance but more is necessary reflecting actual CTC or combat experience.

General statements need to be translated to more specific tasks. To do this, there are two sources. They are the Combined Arms Battle Tasks developed by ARI from CTC experiences and the appropriate ARTEP-MTP developed by the proponent. These task lists are quite detailed. The task lists extracted below from doctrinal publications have been edited to focus on S4 specific tasks associated with the mission to be trained in the developmental Table--Battalion TF Defense, Execution. Specifically, from FM 71-123 above:

> (1) Serving as OIC of battalion/task force combat trains, (2) Serving as primary staff officer in areas of supply,transportation, and field services, (4) Anticipating requirements, (5) Controlling combat trains CP operations, and (6) Monitoring the tactical situation and preparing to assume duties of the battalion/task force main CP.

Note: Most of the Planning responsibilities have been excluded. The Table being developed to explain the BCST concept focuses on Execution, not Planning or Preparation. Planning and Preparation would be the foci of earlier complementary Tables addressing Bn TF Defense.

COMBINED ARMS TASKS BN TF, DEFEND

Execution and Common Phases
Combined Arms Battle Tasks
Battalion Task Force Defend. ARI
Undated (03/92), pp. 47-67

EXECUTION TASK #165 Control Evacuation
SUBTASK: Control Vehicle Recovery and Repair.
STANDARD: Vehicle maintenance time guidelines are used to guide the repair/recovery of vehicles at the following locations:
1) On-site repairs
2) UMCP
Task force recovery vehicles are always effectively utilized.
All formal vehicle diagnostic work is performed at the UMCP.

EXECUTION TASK #167 Maintain Communications
SUBTASK: Effective two way communication with brigade headquarters, maneuver and support forces is continuously maintained by the task force.
STANDARD: Effective and continuous communication is maintained on the following nets between appropriate task force elements:...
3) Administration and Logistics Net... All elements take prompt action to restore lost communications

COMMON TASK #62 Execute Combat Service Support Operations
Task Standard: The administrative and logistical effort effectively supports the task force's ability to sustain itself and its capability to fight.
SUBTASK: Resupply Task Force Subordinate Elements.
STANDARD: The following resupply operations are conducted in accordance with established task force SOPs:
1) LOGPAC load contents.
2) LOGPAC team configuration.
3) LOGPAC release point operations.
Resupply is distributed in accordance with established priorities.
Non-organic task force elements always receive adequate resupply of the following supplies:
1) Class III
2) Class V
3) Class IX (Weapons Systems)
Organic task force elements always receive adequate resupply of the following supplies:
1) Class III
2) Class V
3) Class IX (Weapons Systems)
Class 4 is distributed in the following manner:
1) Distribution complies with execution matrix or established priorities.
2) Materials are delivered to correct location.
3) Materials are delivered on time.
SUBTASK: Conduct Maintenance Activities
STANDARD: The repair of combat vehicles is always performed as far forward as the situation allows.
Vehicle recovery operations always conform with established procedures.
The Unit Maintenance Collection Point effectively accomplishes the following:
1) Repairs of vehicles.
2) Recovery of vehicles to field trains area
The battalion maintenance task organization is always configured to adequately support the maneuver companies.
SUBTASK: Operate Task Force Combat Trains
STANDARD:
The combat trains are always positioned out of enemy direct fire and light mortar range.
The combat trains always remain within an effective supporting distance of the maneuver elements.
The composition of the combat trains is always tailored to conform to the tactical situation
The combat trains are always positioned in an area which effectively supports the following:
1) Cover and Concealment.
2) Facilitates Movement.
3) Facilitates Communications.

COMMON TASK #76 Utilize Combat Service Support Assets
STANDARD:
All available organic transportation assets are fully utilized to conduct resupply activities.
All available supporting assets are correctly utilized to conduct resupply activities.

COMMON TASK #107 Operate Admin/Log Operation Center
SUBTASK: Monitor the Tactical Situation
STANDARD: ALOC personnel correctly determine each of the maneuver element's Resupply Requirements from their "on-hand" status reports.
The ALOC maintains a continuous, effective operation.
The ALOC supervisors are always knowledgeable of the following situations:
1) Enemy.
2) Friendly.
3) Command relationships with non-organic supporting elements.
ALOC personnel effectively control the following operations:
2) Evacuation of vehicles.
Control Service Support Effort
An accurate status of the following are kept current at the ALOC:
2) Vehicles.
3) Weapons Systems.
4) Logistics and maintenance overlay."

Combined Arms Battle Tasks:
BNTF Defense, pp. 63-66

This is a good general list essentially derived from CTC experience. Most of the MOP or MOE are evident and can be collected by observation of the S4 in execution of his or her responsibilities. However, the resolution of the standards is still inadequate. What is "accurate"? What is "effective control" or "effectively utilized "or "knowledgeable" or ...? More precision seems necessary at least for instructional uses by the OCs and OEs. The ARTEP 71-2 MTP provides some support in data suggested to be collected for AARs. This information is readily available in existent TES virtual simulation.

AAR COLLECTION CHART

Table 6-8 Combat Service Support: Observable Results:
Number/percentage of TF vehicles/elements who ran out of Class III or Class V items.
Number/percentage of damaged vehicles recovered vs not recovered.
Table 6-9 Combat service support system; TF vehicle status.
For combat vehicles, recovery vehicles,supply vehicles and command and control vehicles: number damaged, destroyed, in maintenance, Location, date non available and total days. Similar information is suggested for status of barrier material and Class IX requisitions.

ARTEP 71-2, pp. 6-24 to 6-27.

The best detail on S4 tasks and appropriate standards is offered in the task statements chapter of the ARTEP-MTP. These are very specific. They may be perhaps unreasonably specific unless they have been related to specific battlefield conditions. For

example, the standard "a. No vehicles or element runs out of Class III or Class V supplies" may not be appropriate for a Platoon in a "keyhole position" inflicting extraordinary casualties and in so doing exhausting its ammunition. The MOP can now be related to specific performance under very precise conditions as tasks are performed in "a way" execution of Tables. In addition, performance to standard of some of the ARTEP-MTP tasks is not a staff officer responsibility, rather it is a command responsibility of the commander of the responsible functional unit subordinate to or supporting the Battalion. Some--such as performance at the Unit Maintenance Collection Point (UMCP)--have been left in the following list because they are important to mission execution (Bn TF Defense, Execution) and they fall within the area of S4 staff supervision. Evaluator consideration would be given to the competence of the HHC Commander and Battalion Motor Officer and the subordinate Maintenance Teams supporting the Companies who actually exercise command responsibility. Note that some of these tasks such as resupply will not be included in the real time snapshot or vignette of battle--routinely 30 minutes or 1 hour--captured in the Table. They will have to be collected and incorporated into the AAR by supporting simulation "fast forward" capability to be discussed in Appendix 2.4.

Battalion Task Force

TASK: Perform Combat Service Support Operations (7-1-3912):

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 5-145 to 5-151. Only S4 Tasks Included

CONDITION: The TF has an FSB for coordination. The FSB provides pickup/evacuation points, and resupply, medical, and DS maintenance support. Repair parts and other supplies are available.

TASK STANDARD:

a. No vehicles or element runs out of Class III or Class V supplies.
b. Within one hour after the end of a battle or engagement, replenish and cross-level all basic loads to bring to 50 percent.
c. A level of 90 percent OR rate of nonbattle damaged equipment is maintained.
d. All NOC combat weapons systems are repaired or evacuated within one hour (nonbattle) or two hours (battle) of damage.
g. The TF commander is informed of combat status of subordinates to plan and conduct combat operations.
h. All assigned, attached, and DS elements receive CSS.

SUBTASKS AND STANDARDS:

1. Leaders and staff provide the TF commander with a CSS estimate and update him on the combat status.
 a. Provide accurate combat status to the commander and staff, which includes system status, critical systems, and personnel.

b. Provide all CSS limitations (internal and external) that impact on mission execution to the commander ... upon change.
c. Continually update/inform TF commander of critical CSS status shortfalls/problems that affect the ability of the TF to conduct combat operations.

2. TF commander and staff plan and coordinate CSS.
 - Prepare, disseminate, and *update* a CSS plan that supports the commander's concept. (Update during execution).

3. TF performs supply operations from the field trains (LOGPACS) and combat trains.
 a. When possible, basic loads are maintained at levels of 90 percent.
 b. Basic loads of water, Class III items (bulk and package POL), Class V items (individual and crew-served), and Class VIII items are replenished to at least 50 percent.

5. TF maintenance performs unit maintenance collecting point (UMCP) activities.
 g. Contact/recovery teams are dispatched to repair and recover forward damaged vehicles beyond company team maintenance capabilities within 30 minutes of notification.
 i. All vehicles that cannot be repaired at units within established guidelines (time, type of damage, and so on) are evacuated to the UMCP.
 j. All vehicles that cannot be repaired at UMCP within established guidelines are evacuated to the DS maintenance collection point or field trains/BSA.
 k. UMCP maintains communications with the combat trains CP.

6. TF recovers, repairs, and returns nonmission-capable equipment.
 a. Nonmission-capable equipment is diagnosed and appropriate action initiated within one hour.
 b. Recover/repair operations of nonmission-capable equipment are conducted as quickly as possible.
 c. Repaired vehicles/equipment are moved forward on the next LOGPAC if repaired in BSA (field trains).
 e. Repaired/replacement vehicles come forward prepared to fight (combat loaded trained crews).

10. TF performs LOGPAC operations.
 b. Routine CSS coordination is performed between the company teams or platoon representative and S1/S4 representative.
 c. LOGPAC has available resupply for all TF attached, OPCON, and DS elements.

Note that the conditions for this task include the presence of the Forward Support Battalion to provide higher echelon combat service support. While the task list does not address explicitly the requirements for vertical coordination with Brigade and the Division Support command, this coordination is implied. The requirements must be understood by the Battalion S4. Responsibilities down to the subordinate units are explicit as perhaps best represented in the numerous sub tasks addressing LOGPACs. Understanding vertical CSS tasks is clearly a part of the training of Battalion S4s.

Battalion Task Force/COMBAT TRAINS CP
TASK: Operate Combat Trains CP (7-1-3913):

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 5-152 to 5-156. Only S4 Tasks Included

CONDITION: The TF performs tactical operations. Situations occur that require resupply, maintenance, replacement, evacuation, and weapon systems replacement activities.

TASK STANDARD:

a. Combat trains CP supervises and coordinates CSS for the TF.
b. Combat trains CP is not destroyed.
c. Combat trains CP controls movement, positioning, and security of combat trains elements to ensure continuous CSS.
d. Combat trains CP ensures all requested supplies are received by units IAW commander's guidance.

SUBTASKS AND STANDARDS:

1. Combat Trains CP plans CSS operations
 a. S4/S1 develops (paragraph 4 of the OPORD) and *continually updates* a plan that supports the TF plan by providing CSS to accomplish the operation.
 b. Composition of the combat trains is tailored for the tactical situation.
4. Combat trains CP controls combat train elements.
 a. Positioned for and set up security with sectors of fire, weapons positioned, local security, and fire plans.
 b. Positioned and moved to allow rapid and immediate resupply, maintenance support, evacuation, and recovery.
 c. All elements are kept abreast of the tactical situation.
 d. All combat trains elements coordinate their resupply requirements with the combat trains CP.
 e. Movement of combat trains ensure continuous support.
5. Combat trains staff collects combat status from forward companies, separate platoons, and field trains CP; collates and provides information to the commander and staff; and updates.
 a. Information is accurate and complete.
 c. Information pertains to organic, attached, and supporting units.
 d. TF commander is updated on critical CSS status problems (those affecting ability of the battalion to conduct combat operations).
 e. TF CSS operators have knowledge of CSS status to conduct operations.
 f. The following information is maintained by company/team and is current to within one hour.
 - Combat status of combat critical systems. Number on hand/number nonmission capable/number repairable within six hours/location of nonmission capable systems.
 g. Staff maintains status and knows location of internal CSS assets. The quantity and reason for nonmission-capable equipment are provided to within 95 percent on the following: (The below chart should only serve as a guide. The TF and or brigade SOP regarding equipment status will be used.) *MOP determined by actual observation during execution*
 - Supply trucks/trailers.
 - Fuel trucks/trailers.
 - Medical evacuation vehicle.
 - Maintenance recovery vehicle.

- Medics.
- Mechanics.
- Drivers.
- Cooks.
- Communications repair.
- Armor.
- Water trailers.

6. Combat trains CP maintains communications by-
 a. Performing NCS actions for the TF administrative/logistics net.
 b. Keeping abreast of the tactical situation by monitoring the TF command and control net.
 c. Operating as a station on the brigade administrative/logistics net.
 d. Maintaining communication with the field trains CP.
 e. Ensuring combat trains CP is operational 24 hours.
9. CP staff coordinates DS maintenance requests.
 - Within 10 minutes of request from subordinate and attached/OPCON units for DS maintenance, TF maintenance is informed of the request.
10. CP staff coordinates pickup of repaired replacement vehicles with UMCP
 a. Informs maintenance.
 b. Sets priorities during overloaded periods.
 c. Informs units of vehicles to be returned to them and coordinate pickup.
11. Combat trains CP can become battalion main CP.
 a. Stays abreast of tactical situation and maintains a current tactical situation map that has current location of friendly units in battalion sector, current locations of reported enemy in battalion sector, and fire support/obstacle graphics.
 b. Communicates with the brigade tactical and main CPs, and the DS FA TF (verified by communication checks).
12. Combat trains CP controls movement/positioning
 a. TF combat trains CP informs all elements of combat trains of future moves.
 d. All elements are configured in a march order prepared by S4/SI.
 e. All elements move in time to provide continuous, responsive support of the tactical situation.
13. CP staff coordinates resupply, both routine and emergency.
 a. Basic loads are maintained at a level of 90 percent.
 b. Critical resupply items are on hand/uploaded within combat trains.
 f. Resupply for attached, OPCON, and DS units are coordinated/provided.
 g. Attached CSS is controlled by combat trains to ensure coordinated CSS to attached units is accomplished.
 h. Staff requests additional transportation from brigade S4 in an emergency.
 i. Combat trains CP coordinates directly to brigade S4 for emergency supply needs.
 j. LOGPAC delivery times are synchronized to support maneuver plans.
 k. Priorities for resupply, evacuation, and maintenance are established.
14. Combat trains CP subunits requests for resupply/support.
 a. CP personnel monitor battalion command net. They listen for supply requirements and initiate action. They call unit personnel and clarify needs during emergencies.
 b. Initial immediate action on all supply/support requests are sent to field trains CP.
15. CP staff coordinates CSS with field trains.
 a. CP collects supply, personnel, and maintenance information from forward units. It compiles the information and sends it to the field trains CP.
 d. Delivery schedules and locations support the tactical plans.

Battalion Task Force/FIELD TRAINS CP
TASK: Operate Field Trains CP (7-1-3914):

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 5-157 to 5-159. Only S4 Tasks Included

CONDITION: The TF performs tactical operations. It conducts CSS operations using echelons trains.
TASK STANDARD:
a. Field trains CP coordinates CSS requirements with brigade and FSB.
b. LOGPACs are assembled with all required resupply items and other support, and dispatched forward as directed by the S4.
c. Field trains CP is not destroyed, and it defends against enemy attacks. CP has less than 5 percent casualties from enemy attacks.

SUBTASKS AND STANDARDS:
1. S4 plans field trains operations that address the following
 a. HHC commander assists the S4 in developing a plan that supports the TF plan in accomplishing the operation.
 b. Composition of the field trains is tailored for the tactical situation.

Those are the tasks and standards for the Battalion S4. They are complete and do an excellent job of defining what task performance is expected from the S4. There is obvious duplication among and between the various task lists. These should be eliminated by the doctrinal proponent prior to constructing the individual staff officer (S4) task training package. Individual staff task proficiency is necessary but not sufficient. It must be matched by S4 understanding of his or her responsibilities in support of Battle Staff Effectiveness--creating a highly effective organization. This aspect of necessary individual training in Organizational Competence has been described by Olmstead as:

a. Cognitive Role Training

This is formal classroom training and should be designed to provide:

(1) Knowledge about the organization and functions of a battle staff.

(2) Knowledge about Organizational Competence, its rationale, and its essential components.

(3) Knowledge about each organizational process, its definition, and its general criteria of effectiveness.

(4) Knowledge about each battle staff position, its relation to Organizational Competence, the processes most likely to be performed in the position, and how they should be performed.

(5) Knowledge about teamwork requirements in a battle staff, and command expectations about performance as a team.

The preferred method of instruction is lecture-discussion, with the overall objective of providing working knowledge of a battle staff, its roles, and Organizational Competence, its processes, and its effects upon battle staff performance. Training to mastery can be accomplished within approximately 15 hours of classroom instruction.

pp. IX 20-21

As discussed earlier, Olmstead is writing primarily for the training environment within an active component unit. The individual staff officer and staff team training described in this Appendix would be repackaged for distributed training with specific training examples built in to Table development as carefully as the doctrinal S4 tasks listed above will be included. Now, however, the tasks are somewhat different. The MOP need to respond to the established criteria of Organizational Competence:

CRITERIA FOR ASSESSING QUALITY OF PROCESS PERFORMANCE

Sensing

1. Accurate detection of all available information.
2. Correct interpretation (attachment of correct meaning) of all detected information, to include appropriate weighting of its importance.
3. Accurate discrimination between relevant and irrelevant information.
4. Attempts to obtain information are relevant to mission, task, or problem.
5. Sensing activities are timely in relation to information requirements and the tactical situation of the moment.
6. Internal processing and recording of information provides ready availability to users.

Communicating Information

1. Accuracy of transmission of available information.
2. Sufficiently complete to transmit full and accurate understanding to receivers of communications.
3. Timeliness appropriate to unit requirements.
4. Correct choice of recipients; everyone who needs information receives it.
5. Whether message should have been communicated.

Decision Making

1. Adequacy--Was the decision adequately correct in view of circumstances and information available to the decision maker?
2. Appropriateness--Was the decision timely in view of the information available to the decision maker?
3. Completeness--Did the decision take into account all or most contingencies, alternatives, and possibilities?

Stabilizing

1. Adequacy--Action is correct in view of the operational situation and conditions which the action is intended to change or overcome.
2. Appropriateness--Timing is appropriate in view of the situation, conditions, and intended effects. Choice of target of the action is appropriate.
3. Completeness--Action fully meets the requirements of the situation.

Communicating Implementation

1. Accuracy of transmission of instructions.
2. Sufficient completeness to transmit adequate and full understanding of actions required.
3. Timely transmission in view of both available information and the action requirements of the participants.
4. Transmission to appropriate recipients.
5. "Discussion or interpretation" is efficient, relevant, and achieves its purpose.
6. Whether message should have been communicated?

Coping Actions

1. Correctness of actions in view of both the current operational circumstances and the decision or order from which the action derives.
2. Timeliness of the action in view of both operational circumstances and the decision or order from which the action derives.
3. Correctness of choice of target of the action.
4. Adequacy of execution of action.

Feedback

1. Correctness of the decision and action to obtain feedback in view of operational circumstances, the preceding actions whose results are being evaluated, and current information requirements.
2. Timeliness of the feedback decision and action.
3. Correctness of choice of target(s) of the action.
4. Appropriate use of feedback information in new actions, decisions, and plans.

Olmstead, *Battle Staff Integration*, pp. C3, C4

These are broad criteria. They are applicable in the training of individual staff officers and staff teams both for general understanding of the processes and their importance in contributing to Battle Staff Effectiveness and for developing specific tactical examples and comparison "probes" designed to be used by OE personnel. For now, the challenge is to ensure that the S4 individual training package trains not only the prescribed S4 doctrinal tasks (AMTP-MTP 71-2) but also that it trains the organizational processes appropriate to the S4 position in executing Battalion Task Force Defense to standard.

These staff tasks and organizational competence processes now need to be tied to explicit Measures of Performance which can be used in the AAR. That brings us to Step 2.

STEP 2. DESCRIBE WHAT MUST OCCUR IN "A WAY" WARFIGHT TO CAUSE EVALUATION DATA REQUIRED IN 1 ABOVE TO BE DEVELOPED.

There appear to be few specific requirements which need to be added to a standard CTC type Battalion Task Force Defense in order to develop the very specific MOP data necessary to create the training support for S4 training. They are:

- The unit should start the operation (Receipt of Mission from Brigade) already degraded from previous operations so that there is no surplus in the logistics system. Logistics operations must be conducted throughout the conduct of the defense
- The enemy should be sufficiently capable that even the highly competent "a way" unit is required to modify its plans substantially during execution of the defense so that logistic staff processes are stressed.

3. FIGHT THE "A WAY" COMBAT ACTION, COLLECT EXPLICIT MOP DATA RELATED TO EACH OF THE SELECTED TASKS.

The "a way" action should be fought by a CTC-validated Battalion Task Force in TES virtual simulation (SIMNET) with all staff positions fully manned. Mission: daylight Defense in Sector. Units should be manned down to Platoon Leader level--individual AFV in Semi-Automated Forces. AAR conducted, and recorded, for each individual staff officer, staff team. and entire Battle Staff.

Development of the training support for the S4 will require particular emphasis on representing logistic requirements from the Companies up and from Brigade and Division Support Command (Forward Support Battalion) down. The challenge is to draw on the overall battalion defense scenario to bring out S4 MOP/MOE in sufficient detail to support the individual staff position training packages or Modules for distributed training. Think of the problem as: What are the necessary cues to stimulate S4 staff actions in response to the S4 MOP/MOE defined above? Then create those cues in the "a way" battalion combat action in virtual simulation in order to create the necessary training support.

The "a way" unit should be prepared to execute several full repetitions of the mission to constant initial METT-T from receipt of the mission warning order from Brigade to assignment of the next mission with full documentation as described above. Note: For

purposes of concept development, full documentation is necessary only for the Execution Phase. Considering the effort required to secure this, it may be desirable to collect data for Planning and Preparation as well. Then all of the necessary documentation will be available for subsequent completion of all phases of defense without having to reassemble the "a way" experienced Battalion TF.

4. WRITE EXPANDED MOP ORIENTED TO THE "A WAY" EXECUTION--IF MOE ARE INVOLVED, EXPLAIN THE NATURE OF THE EXPERT INTERPRETATION OF MOP WHICH IS REQUIRED.

This should be an exercise in detailed "filling in the blanks." Each of the general MOP/MOE listed in Step 1 above relating to Bn TF Defense, Execution should be expanded using the actual warfight data captured during the warfights conducted in Step 3 above. Specific amounts, locations, and times should be recorded in detail with all of the source back up cross-referenced for further training use including whenever possible visual confirmation through Plan View Display or Stealth Out of Window displays of critical actions.

Examples follow of detailed "a way" MOP/MOE. Assuming that the Proponent selected all of the S4 tasks in Battalion Task Force Task Perform combat service support operations (7-1-3912), those subtasks are listed. The general subtask and standard is followed by the detailed data which should be collected from execution of the mission. To avoid errors and omissions, each MOP/MOE should have similar documentation of detail provided prior to "a way" execution so that all know what data must be collected in Table preparation in step 5 below.

Extract: Battalion Task Force--
TASK: Perform combat service support operations (7-1-3912):

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 5-145 to 5-151. Only S4 Tasks Included

SUBTASKS AND STANDARDS:

1. Leaders and staff provide the TF commander with a CSS estimate and update him on the combat status.
 a. Provide accurate combat status to the commander and staff, which includes system status, critical systems.... Compare S4/ALOC combat status reports to actual status every 15 minutes of Execution. Annotate time and accuracy discrepancies. Compare ALOC to TOC and Field Trains data held every 15 minutes.

b. Provide all CSS limitations (internal and external) that impact on mission execution to the commander ... upon change. Record actual CSS limitations within Bn and in FSB compared to those reported to the commander by the S4.

c. Continually update/inform TF commander of critical CSS status shortfalls/problems that affect the ability of the TF to conduct combat operations. Compare actual shortfalls/problems to those known by the S4. Of those known to S4, what was known by the commander, how quickly (responsively)?

2. TF commander and staff plan and coordinate CSS.
 - Prepare, disseminate, and *update* a CSS plan that supports the commander's concept. (Update during execution). Record updates accomplished, assessment of the effect on outcome of the defense?

3. TF performs supply operations from the field trains (LOGPACS) and combat trains
 a. When possible, basic loads are maintained at levels of 90 percent.
 b. Basic loads of water, Class III items (bulk and package POL), Class V items (individual and crew-served), and Class VIII items are replenished to at least 50 percent. In each case, how much of what was provided when to which locations? What percent of the subordinate unit resupply requirement was met?

5. TF maintenance performs unit maintenance collecting point (UMCP) activities.
 g. Contact/recovery teams are dispatched to repair and recover forward damaged vehicles beyond company team maintenance capabilities within 30 minutes of notification. Number of teams dispatched, when?
 i. All vehicles that cannot be repaired at units within established guidelines (time,type of damage, and so on) are evacuated to the UMCP. Number of vehicles evacuated.
 j. All vehicles that cannot be repaired at UMCP within established guidelines are evacuated to the DS maintenance collection point or field trains/BSA. Number of vehicles evacuated. Note select an arbitrary time and location of evacuation for cut off of analysis.
 k. UMCP maintains communications with the combat trains CP. Percent of Execution time when communication is out.

6. TF recovers, repairs, and returns nonmission-capable equipment.
 a. Nonmission-capable equipment is diagnosed and appropriate action initiated within one hour. Compare actual nonmission capable to that diagnosed and action initiated within one hour.
 b. Recover/repair operations of nonmission-capable equipment are conducted as quickly as possible. Actual compared to what accomplished during the Table. Expert assess "as possible"--MOE rather than MOP.
 c. Repaired vehicles/equipment are moved forward on the next LOGPAC if repaired in BSA (field trains). Compare actual and what done by unit. Establish explicit standard.
 e. Repaired/replacement vehicles come forward prepared to fight (combat loaded trained crews). Compare actual and what done by unit. Establish explicit standard.

10. TF performs LOGPAC operations.
 b. Routine CSS coordination is performed between the company teams or platoon representative and S1/S4 representative. List critical elements of coordination, record content, timeliness of reporting.
 c. LOGPAC has available resupply for all TF attached, OPCON, and DS elements. Compare actual LOGPAC requirements by unit to that accomplished. End of example-S4 MOP/MOE development.

5. TRANSLATE THE SPECIFIC "A WAY" MOP TO THE MOP COLLECTION REQUIREMENTS FOR "YOUR WAY" EXECUTION OF THE TABLE OR MODULE.

After Step 4, the detailed collection requirement has been established for the Module training exercise for the S4. The challenge now is to develop a plan primarily automated but also including the use of trained OCs and OEs to permit collection of the detailed MOP and MOE in a timely manner. This has to be done to structure the AAR of the "a way" Module exercise for the S4. Once the resulting structured exercise is validated by use in a Proof of Principle, that methodology applies to collecting the MOP/MOE for the training of "your way" S4 as a initial part of BCST. This data could be used "stand alone" or in comparison to the MOP/MOE record of the performance of the S4 in the "a way" unit.

Thus the first major ingredient for the primary unit staff training vehicle, the AAR, is developed. The individual staff officer is provided a rigorous program for mastering his or her individual tactical, technical competence as well as understanding and practicing the requirements of Organizational Competence. Similar programs need to be developed for each staff position. Now to the small staff teams which must work in concert to enable the synchronization of BOS expected in operations conducted in executing Airland Battle doctrine. Now documentation needs to be prepared for both Staff Task Proficiency and Battle Staff Effectiveness.

S2, S3, FSO

The problem of MOP development is somewhat less complex for staff team tasks. In the preceding action, all of the primary staff individual tasks will have been tied to doctrinally correct MOP or MOE. When considering staff teams, Table-related training programs--Modules--in individual Staff Task Proficiency and Battle Staff Effectiveness can be assumed to be present for each staff position. In translating from individual staff officer to the small team, the task is to group individual tasks as they converge in areas of cross-BOS staff coordination. For example, the S2, S3, Engineer team is constrained to tasks and MOP associated with Mobility, Countermobility, and Survivability in areas of S2 and S3 interest (with the FSO for Fire support). The S4, S3, Air Defense team is concerned about tasks and MOP related to the Air Defense Battlefield Operating System in areas of S4 and S3 interest.

There is more to staff teams than horizontal team development as is described above at battalion echelon. Vertical teaming is equally important. Each primary staff officer is a

member of a vertical network of staff officers and some functional area commanders, all of whom are concerned about the effective coordination of the various Battlefield Operating Systems from the lowest unit to Echelons above Division or Corps. The Fire Support Officer at battalion maintains close contact with the DS Artillery Battalion and through it with Division Artillery and in some cases with Corps Artillery. That vertical fire support team has to be trained just as rigorously as does the intra Bn or Bde staff team. Precisely that vertical coordination is addressed in the proposed Fire Coordination Exercise. See App. 1.2.

For concept development purposes, the battalion staff team developed here is the S2, S3, FSO--synchronization of direct and indirect fires at battalion echelon. Therefore, the tasks and appropriate MOP of the S2 and S3 are narrowed to areas of Fire Support overlap.[3]

The general steps for MOP development for development of Staff Task Proficiency and Battle Staff Effectiveness for small staff teams are as they were for individual staff officer proficiency:

STEP 1. DEFINE TASKS, CONDITIONS, AND STANDARDS FOR THE S2, S3, FSO STAFF TEAM

General responsibilities for this staff team are included in FM 71-2:

6-3. PLANNING CONSIDERATIONS (Extract)

b. One of the commander's greatest challenges is in synchronizing and concentrating all of his combat power at the critical time and place. There will be a multitude of targets to engage in a short time and a time lag from the time the decision is made to use supporting fires until the target is hit. The commander alone will not have the time to integrate all the weapons available to him in terms of concentrated combat power. The FSO assists the commander by developing the fire support plan concurrently with the maneuver plan. During the battle, the FSO and fire support section monitor the execution of fire support to ensure compliance with the commander's intent and to provide continuous support.

c. In using fire support, the task force commander considers the following.

3 If the development challenge were to establish MOP/MOE for a vertical team, the process would be similar with the team limited to Company FIST, Battalion FSO and Brigade FSO-DS Arty Battalion Commander.

(1) Fire support to complement maneuver systems. Fires are used to accomplish missions that maneuver forces cannot, or that would otherwise divert maneuver forces from the main effort, such as suppressing an enemy position to allow concentration of maneuver forces elsewhere.

(3) Most effective roles. To best integrate fire support, the task force commander must know the capabilities and limitations of all supporting fires and ensure that fire support is used where and when it will be most effective. The combined fires of an FA battalion and the battalion's mortar platoon can cover less than a square kilometer and, therefore, must be judiciously planned.

d. The planning and coordination processes begin when the mission is received or assumed, and they never stop. The commander, XO, S3, S2, and FSO interact throughout the planning and execution of the mission to ensure that fire planning is a continuing process....

The commander must ensure that he clearly states his intent for fire support, that his fire support plan is developed accordingly, that all available fire support is considered, and that each phase of the maneuver plan is supported by the fire plan. The FSO must ensure that he understands the commander's requirements for fire support.

FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force*, September 1988, pp. 6-4, -5

The really tough doctrinal challenge to synchronize is underlined in the extract above. Clearly there is a challenge of continuing coordination between the S2, S3, and FSO during execution of the defense. Coordination requirements are described in greater depth in the Combined Arms Battle Tasks for Bn TF Defense, Execution. The following tasks and standards extract standards relevant to synchronization from the Combined Arms Battle Tasks

COMBINED ARMS TASKS Bn TF, Defend

Execution and Common Phases
Combined Arms Battle Tasks
Battalion Task Force Defend
ARI Undated (03/92), pp. 47-67.

EXECUTION TASK #68 Conduct Reconnaissance and Surveillance Effort
STANDARD: Enemy activities and intentions are continuously monitored and known by the Task Force
SUBTASK: Process Combat Information
The situational template is always updated to reflect new information.
The situational template is continuously verified through the use of new information.

Predicted enemy courses of action are always adjusted as necessary based on new information.
The event template is always adjusted as the situational templ[illegible]equires.

EXECUTION TASK #73 Execute Fire Support Pian
STANDARD: Supporting fires are fired in accordance with priorities established by the decision matrix and as modified by the Task Force Commander.
The following fires are always accurately placed on prescribed targets:
1) CAS
2) Artillery
3) Mortars
4) FASCAM

EXECUTION TASK #72 Execute Maneuver Scheme
STANDARD: Concentrated direct fires on the enemy force are maintained throughout the battle
SUBTASK: Shift Main Effort
STANDARD:
Commander correctly identifies changes in the enemy threat.
Adjustments to the task force main effort are made in accordance with pre-planned contingencies.
Fires are effectively shifted in response to the threat.
Appropriate forces are shifted to better engage the enemy.

EXECUTION TASK #78 Execute Decision Matrix
STANDARD: Task force fire and maneuver are orchestrated in accordance with scheduled tactical events
Appropriate orders are always issued, when the tactical situation coincides with the anticipated battle scenario, for the following:
1) Maneuver events.
2) Firing events.
The following prearranged events are always activated by the tactical situation:
1) Direct fire initiation.
2) Indirect fire initiation.
3) Obstacle employment.
4) Air support
5) Commitment of reserve forces.
6) Movement by maneuver companies to other positions.
Effective instructions are issued to appropriate elements for modifications to the decision matrix.

EXECUTION TASK #79 Control Supporting Fires
STANDARD: Supporting fires are executed in accordance with designated priorities and/or orders
Supporting fires are correctly executed in accordance with the following:
1) Fire support execution matrix.
2) Commander's directions.
3) Established rules of engagement for firing out of sector.
Supporting fires are integrated with the following:
1) Attack helicopters.
2) Close Air Support.

EXECUTION TASK # 159 Position Fire Support Forces
STANDARD: Fire support forces are repositioned to continuously provide effective support to maneuver elements.
The following fire support forces are always able to provide continuous coverage to task force elements.
1) Direct support artillery
2) Mortars

EXECUTION TASK #170 Issue FRAGO
STANDARD: Mission essential information is communicated to subordinate elements in sufficient time to allow their actions to be proactive
The following are always accomplished:
1) The order is given in a timely manner.
2) The order correctly relays the Commander's intent.
3) The order is direct and concise.
Subordinate leaders understand adjustments.

EXECUTION TASK #177 Comply with Commander's Intent
STANDARD: Mission essential tasks are accomplished in accordance with planned operational concepts and modifications as directed by the commander
Mission tasks are correctly accomplished with regard to the following factors:
1) Unit combat effectiveness is maintained throughout the duration of the mission.
2) The desired task outcomes are attained.

Combined Arms Battle Tasks: BNTF Defense
pp. 50-58

These are still broad tasks and standards which cross Battlefield Operating Systems. The requirements for coordination are more evident; however, there is not sufficient detail to prescribe staff team tasks much less what the more precise MOP/MOE for "a way" execution might be. As it was in developing individual staff officer responsibilities (S4 above) the ARTEP 71-2 MTP is more detailed. Again, consistent with the unit mission focus on Battalion TF Defense, Execution, only tasks relevant to that mission have been included. Note that standards now become very explicit--suitable for developing precise MOP and MOE for Staff Task Proficiency. They are underlined.

Battalion Task Force TASK: Defend (7-1-3009)

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988,
pp. 5-33, 34. Only S4 Tasks Included

CONDITION: The TF defends in the forward portion of the MBA. A covering force forward of the TF gives the TF early warning. The covering force withdraws. The enemy performs reconnaissance, breaching, and infiltration to prepare for the attack. The enemy attacks with an MRB(+).

NOTE: This t ay be a battle position defense or defense in sector, depending upon METT-T factors.

TASK STANDARD:

a. The TF is prepared to defend at the time prescribed.
b. The enemy MRR is defeated forward (50 percent or more destroyed, wounded, or captured) forward of the battalion rear boundary.
c. The TF performs the defense IAW the brigade commander's intent for coordination with adjacent TFs.
d. There is no penetration of rear boundary by an MRC(+) or more. TF sustains less than 30 percent casualties.

SUBTASKS AND STANDARDS

4. TF defeats the attack.
 a. The enemy MRR is defeated forward of the TF rear boundary. There is no MRC or larger penetration of the TF rear boundary.
 b. TF performs the defense IAW the brigade commander's intent for coordination with adjacent battalions. Movements do not uncover adjacent battalion.
 c. TF has at least 70 percent personnel and equipment after consolidation and reorganization, and it can continue its mission.

These are very explicit and demanding standards. We know the desired performance outcomes but there is insufficient detail on synchronization to structure the staff team training for the S2, S3, FSO staff team. For that, we must pick and choose from several ARTEP-MTP tasks: Command and Control the Battalion Task Force, Command Group operations, Perform S2 operations, and Employ fire support: Explicit standards suitable for MOE/MOP development are underlined.

TASK: COMMAND and CONTROL the battalion task force (7-1-3901) (FM 71-2, FM 101-5)

CONDITION: The brigade issues an OPORD, warning order, or FRAGO.

TASK STANDARD:

a. The TF plan accomplishes the directed specified tasks IAW the brigade commander's concept and intent. The plan is received and understood by the leadership of the TF. It is coordinated with higher, adjacent, and supporting elements.
b. The TF is prepared to initiate the mission at the directed time.
c. The TF controls and synchronizes subordinate and supporting elements so that it accomplishes the mission and preserves the force.
d. The TF keeps higher, adjacent, subordinate, supporting, and supported headquarters informed.

12. TF leaders command and control the execution.
 a. Subordinate elements report enemy and friendly actions, change in status, and any other factor that would require change within three minutes.
 b. TF leaders win the battle by directing the maneuver of units, controlling direct and indirect fires, and directing other CS actions to cope with new METT-T factors. Indicators are:
 - Elements not following OPORD are corrected.
 - Responses to new METT-T are directed when new situation occurs.

- No friendly casualties inflicted by friendly direct or indirect fires.
- Number/percentage of direct fire weapons engaging enemy.
- Number of indirect fire rounds fired and percentage hitting/suppressing the enemy.
- Number of enemy casualties.
- Number of friendly casualties.

e. Command and control, and CSS assets are controlled to support maneuver effort. Indicators are:
- Effective CSS, and command and control.
- Command and control or CSS element not destroyed by enemy direct fires.

d. FRAGOs are clear, concise, and quickly executed by subordinates.
e. Changes that affect the battle are disseminated within five minutes.

13. Subordinate commanders, leaders, and staff laterally coordinate actions during the battle
- All battle actions requiring coordination between battalion elements are laterally coordinated.

14. TF coordinates with adjacent and supporting headquarters.
- All battle actions requiring coordination with other headquarters are laterally and promptly coordinated.

15. TF reports.
- TF CPs submit all critical and required reports to brigade. They report events to adjacent and supporting elements that impact on them in time for those units to react.

TASK: COMMAND GROUP operations (7-1-3903) (FM 71-2, Chapter 2; TACP 51-55)

CONDITION: The TF conducts tactical operations against an enemy. Changes in METT-T require control and coordination actions.
TASK STANDARD:
a. The command group coordinates and directs the maneuver of combat forces, controls direct and indirect fires, and coordinates other critical activities to win the battle.
b. The commander informs the main CP of anticipated changes in subordinate unit missions.

3. Command group follows the battle.
- Command group monitors the development of the enemy and friendly situations.

4. Command group directs the maneuver and fires of combat forces
a. TF wins the battle.
b. TF commander controls fire and maneuver of company teams or supporting combat elements by giving FRAGOs to—
- Correct elements not following OPLAN/OPORD.
- Change plan to respond to new METT-T factors.
- Control direct fires on the enemy.

c. TF commander directs changes in missions/tasks for fire support, ADA, scouts, antiarmor elements, engineer elements, and other CS to respond to changes in METT-T. He controls directly or by instructing the main CP to issue a FRAGO.

5. FSO coordinates the execution of fire support.
a. Fire support assists the TF to accomplish the mission and does not fire on friendly forces.
b. FSO modifies the fire support plan to conform to new factors of METT-T or new guidance from the TF commander. He directs subordinate FSO/FISTs or other elements to engage portions of the enemy formation/positions, or he changes priorities of fires or priority of targets, or he gives other guidance.

c. FSO directs the FSE to accomplish coordination actions that the FSO cannot.
d. FSO directs the FAC to request immediate CAS (at least 30 minutes before needed time on target).

6. FAC directs CAS strikes.
 a. CAS strikes contribute to mission success.
 b. CAS does not strike friendly elements
 c. CAS is directed IAW procedures outlined in TACP 51-55.
7. Command group performs lateral coordination with adjacent/forward battalions
 - Actions of the enemy battalion or other situations that impact on adjacent or forward TFs are quickly coordinated. The command group accomplishes this directly or through the main CP.
8. Command group reports
 a. XO/S3 augments the reports of subordinate elements to keep the main CP informed of the forward tactical situation.
 b. Sends critical reports to the brigade tactical CP.

TASK: PERFORM S2 operations (7-1-3906) (FMs 71-2, and 34-3)

CONDITION: The TF conducts combat operations.
TASK STANDARD:
 a. The S2 section collects, analyzes, and disseminates information on enemy, terrain, and weather timely and accurately, which allows the TF to conduct combat operations.
 b. The S2 section prepares and updates IPB that is 70 percent accurate and prevents the TF from being surprised by the enemy.
 c. Templates are validated with updated information gathered.

7. S2 disseminates and coordinates intelligence information.
 - Templates, intelligence estimate, weather, and other intelligence updates are provided to the commander, staff, and subordinates as soon as new information is available or requires changes in the intelligence estimate or templates.
8. S2 coordinates intelligence information with the staff.
 b. S3 section: Templates, estimates, terrain analysis, and R&S plan.
 c. FSE: Known, suspected, and likely enemy locations and other targeting information; likely enemy fire support actions for inclusion into templates and estimates.
 d. FAC, S3 air, helicopter unit commander, and ADA officer: Likely enemy use of CAS, attack helicopters, and air approaches.
 f. All staff personnel: All intelligence information received on their nets is reported to the S2.

TASK: EMPLOY fire support (7-1-3907) (FM 71-2)

CONDITION: The TF has priority of fires from a DS FA battalion and has been given CAS sorties for planning purposes. TF mortars have been incorporated into the plan. Immediate or additional sorties are available upon request.
TASK STANDARD:
 a. All available supporting fires are executed to accomplish tasks that best support the commander's intent/concept to accomplish the mission. Available fires attack critically vulnerable areas of enemy formations or positions.
 b. At least 80 percent of the missions fired suppresses/neutralizes/destroys the enemy or accomplishes the commanders intent.
 c. Friendly supporting fires do not hit friendly forces.
 d. The DS FA battalion is updated on the location of all TF elements.

4. TF executes fire support
 a. Friendly fires stop or slow enemy movement.
 b. Friendly fires sufficiently suppress enemy fires.
 d. Volume of fires accomplish the desired task. (See Appendix A. Note: App. A: Rules of Engagement for FTX not relevant for staff team task development)
 e. Friendly supporting fires do not result in fratricide.
 f. Friendly forces are not silhouetted by friendly FA smoke.
 g. Fire support priorities and tasks are adjusted as the battle progresses.
5. TF executes immediate CAS.
 a. FSE initiates immediate CAS request on approved targets.
 b. Targets not approved for CAS are serviced by other fire support assets.
 c. Requests are transmitted to FAC.
 d. Artillery support is coordinated and used until CAS arrives.
 e. TF fires and smoke suppress observed enemy air defense weapons within range.

ARTEP 71-2 MTP provides appropriate guidance for the development of a prototype of Staff Task Proficiency, that is, S2, S3, FSO small team tactical/technical competence by "cutting and pasting" from existing BOS-related tasks. Nowhere is there an integrated statement of the conceptual doctrinal contribution of this team operating to achieve synchronization at the Battalion echelon.[4] There has not been a training development requirement to create small team tasks across TRADOC Proponents-Battlefield Operating Systems. Yet a clear need manifested at the Combat Training Centers has started the process of development.

Good work has been done on just this issue at the battalion echelon by the Fire Support Proponent at Fort Sill. TC 6-71 has been prepared as a "Fire Support Handbook for the Maneuver Commander." In addition to discussing general tasks associated with the effective integration of direct and indirect fires, it addresses the end results desired in the form of a general checklist for the use of the TF commander in focusing combat power. In so doing, the Training Circular really defines the product expected from the S2, S3, FSO staff team as the battle flows. The Handbook discusses various missions. Only defense is extracted here consistent with selection of the defense for development.

DEFENSIVE OPERATIONS

> In defensive operations, coordination of maneuver units with fire support assets is essential. Fire support is generally used against the enemy at maximum range to cause him to button up and slow down. Obstacles are

[4] Synchronization becomes an integral part of staff tasks at Brigade. An excellent example is Task: Synchronize Deep and Rear Operations with Close Operations (71-3-3008) in ARTEP 71-3 MTP, *Mission Training Plan For The Heavy Brigade Command Group and Staff*, 3 October 1988, pp. 5-86 to -88.

covered with fires, and enemy air defense is suppressed (SEAD). Therefore, our tactical air and attack helicopters can operate effectively.

Security Area Operations

In any defense, a covering force or screening force serves as the forward security echelon in close operations. The security force occupies a sector far enough forward of the FEBA to protect main battle area (MBA) units from surprise, to give MBA commanders time to reposition their forces to meet the enemy attack, and to prevent enemy medium-range artillery from firing on the FEBA. A screening force cannot do more than that. A covering force gains and keeps contact with attacking enemy forces, can develop the situation, and delays or defeats the enemy's leading units. Fire support can cause this to happen and can deceive the enemy into believing he has hit the MBA. When your FSO plans or employs your assets, make sure he does the following:

- Plans fires in your covering force area to cut off first-echelon forces from second-echelon forces and to attack units in choke points, assembly areas, or assault positions.
- Plans fires to engage the enemy once he has entered your area of influence. This causes the enemy to deploy, slow, and canalize. Use FASCAM and DPICM.
- Coordinates with the engineers to cover obstacles with fire. Considers using FASCAM to fill in the gaps in your obstacles and/or barrier plans.
- Plans fires such as smoke to obscure and suppress enemy overwatch positions. However, heavy concentrations of white phosphorus (WP) or smoke may degrade the use of thermal sights.
- Plans fires on command and control elements and key enemy vehicles to cause confusion, force deployment, break up formations, separate tanks from infantry, and force tanks to button up.
- Plans fires to cover disengagement and repositioning of maneuver elements.
- Plans fires to complement your direct-fire weapons--tank, TOW, and Dragon.
- Coordinates with MBA artillery for more fires within your covering force area.
- Transmits fire support coordinating measures to MBA forces to protect maneuver units that are operating in the covering force area (CFA). For example, if a unit has been isolated in its CFA, a no-fire area (NFA) should be transmitted by your FSE to ensure the safety of the isolated force.
- Uses COLTs well forward to overwatch likely avenues of approach to provide early warning and engage enemy armor. You should not obscure the target with smoke, because COLTs may not be able to engage the target.

REMEMBER

Have your FSO plan airspace coordination areas (ACAs), and use them if they are approved.

Finally, be prepared for future operations. There is a good chance that you may displace into the MBA and a passage of lines will occur. Ensure you coordinate these activities. Major problems will occur if we do not plan for future operations. Have your FSO keep the supporting FA units advised of the tactical situation. This alerts them well in advance to any possible displacements.

Main Battle Area

Since your MBA fire support planning is refined during the covering force operations, most of the defending force is deployed in the MBA to decisively engage and defeat the enemy's main thrust. Targeting information must flow from the covering forces to the MBA forces. Fire support is more centralized at a higher echelon to be more flexible and responsive to an unknown situation. When using fire support assets, consider the following:

- Plan fires to supplement direct-fire weapons, interlocking and overlapping fields of fire. Artillery and mortar FPFs should be planned and closely tied to direct-fire FPFs for your maneuver subunits.
- Plan fires to slow and canalize the enemy to provide better shots for your tank, TOW, and Dragon gunners. Priority of fires should be to your most likely avenue of approach.
- Plan HE and FASCAM fires on obstacles to reinforce or reestablish them. Coordinate fire plans with the unit covering the obstacles.
- Use smoke screens behind forward enemy elements to isolate them from their follow-on elements and to break up their formations.
- Coordinate with the covering force FSOs to support rearward passage of the covering force echelon.
- Have the FSO plan, update, and fire SEAD. Use other protective measures when aircraft are incoming in support of your forces. Do not forget about airspace coordination areas.
- Plan fires to support disengagement and repositioning of your maneuver forces. Also, your fire support assets must displace by echelon to ensure continuous fire support. Check with your FSO.
- Ensure that your FSO supports any counterattacks or provides counterfire, if necessary.
- Stockpile ammunition here. This is it. You must hold the enemy!

TC 6-71, *Fire Support Handbook For The Maneuver Commander*, November 1988, pp. 24-27

The range of activities which must be coordinated to enable the guidance expressed in this Handbook is formidable. Clearly many complex tasks must be practiced frequently if they are to be performed under great stress on a swirling fast-paced battlefield. Yet more than task proficiency is required. The S2, S3, FSO must also work effectively as a team under the overwatch of the XO, displaying mastery of the attributes of Battle Staff Effectiveness. The same processes associated with Organizational Competence for individual staff officers apply to the small staff team (Sensing, Communicating Information, Decision Making, Stabilizing, Communicating Implementation, Coping Actions and Feedback). In his model for the development of Battle Staff Effectiveness, Olmstead describes the development of staff team skills as necessary experiential training--described as the base building block of team competencies:

> b. Experiential Training
>
> This type of training is intended to provide practice, feedback, and critique to battle staff members in the performance of their respective roles within a team context. Through such experiences, knowledge obtained in Cognitive Role Training is reinforced and converted to individual Role-Specific Skills ... those skills required by individual members in order for them to contribute effectively to the collective execution of team functions or team processes.
>
> ...Ideally, experiential training should be conducted to mastery of the following instructional objectives.
>
> Each member of the battle staff should:
>
> (1) Know and be able to perform satisfactorily all role requirements for his own position.
>
> (2) Know the general role requirements for all other positions in the battle staff.
>
> (3) Be able to perform satisfactorily all coordinative requirements of his role.
>
> (4) Be able to execute satisfactorily all seven organizational processes, as appropriate for his own position.
>
> (5) In coordination with all other positions in the battle staff, be able to perform and adapt to requirements of varying task situations as required.
>
> Olmstead, *Battle Staff Integration*, pp. IX-21, -22. Emphasis mine.

Experiential training as described above is necessary but not sufficient to develop the levels of staff team proficiency required to execute what the Handbook describes as necessary proficiency. Each individual staff member must know his or her job--described

above for the S4 as Cognitive Role Training--and they must master the team skills mandated in Experiential Training. Olmstead sums up the overall training requirement as the following "developmental activities" which the unit should pursue. There are four elements: Cognitive Role Training, Battle Staff Experiential Training, Unit Operational Training, and Shared Success Experiences.

> (1) Cognitive Role Training (Individual)
>
> In this training, primary focus is upon providing all battle staff members with (1) full cognitive understanding of performance requirements for each role; (2) detailed understanding of Organizational Competence and the definitions and performance requirements of each organizational process; and, most important, (3) recognition and understanding of the battle staff as a team, together with the requirements of teamwork in battle staffs.
>
> (2) Battle Staff Experiential Training (Team)
>
> This training follows Cognitive Role Training and should be designed to provide practical experience in battle staff functioning under carefully controlled conditions. It is analogous to the Army's "practical exercises," and should be conducted as practical team training for battle staffs separate from the remainder of their units. The training is characterized by objectives-based practical exercises, analyses of performance, and feedback of results.
>
> (3) Unit Operational Training
>
> All unit field training in operations should include observation, assessment, and feedback of battle staff functioning, especially with respect to Organizational Competence. In short, Competence training should be an integral part of unit operational training.
>
> (4) Shared Success Experiences
>
> ... an important requisite for the development of cohesion is shared experiences of success in matters of importance to the team. From the standpoint of planned battle staff development, systematic provision of successful experiential and operational training experiences is the method of choice....
>
> Olmstead, *Battle Staff Integration*, p. VI-7. Emphasis mine.

Olmstead's focus is on Battle Staff Effectiveness although the need for Staff Task Proficiency--individual and small team--is acknowledged throughout the developmental activities recommended. The BCST model proposed for DARPA/ARNG use places equal emphasis on Battle Staff Effectiveness (organizational processes) and Staff Task Proficiency (warfighting task proficiency). Quite deliberately, the individual and team warfighting tasks prescribed by doctrinal publication (ARTEP-MTP) have been discussed

in both the S4 and S2, S3, FSO examples above before discussing the organizational processes and staff team building--Olmstead's model. The small staff team MOP/MOE which we are in the process of describing support both Experiential Training and the Unit Operational Training described above. These MOP/MOE will be equally important to providing shared success experiences in both Battle Staff Experiential Training, incorporated in structured small team staff exercises and Tables and in Unit Operational Training embedded in Tables and Staff STX trained in CPX,CFX and FTX prescribed in FM 25-101.

These staff team tasks and organizational competence processes now need to be tied to explicit Measures of Performance (assessed by "Probes" in the Olmstead model) which can be used in the AAR. That brings us to Step 2 for staff team training.

2. DESCRIBE WHAT MUST OCCUR IN "A WAY" WARFIGHT TO CAUSE EVALUATION DATA REQUIRED IN 1 ABOVE TO BE DEVELOPED.

There appear to be few specific requirements which need to be added to a standard CTC type Battalion Task Force Defense in order to develop the very specific MOP data necessary to create the training support for S2, S3, FSO small team training. They are:

- The unit should experience substantial changes in available fire support during execution of the defense so that there are continuing synchronization requirements, both planned and immediate, during execution of the defense.
- The enemy should be sufficiently capable that even the highly competent "a way" unit is required to modify its plans substantially during execution of the defense so that direct and indirect fire synchronization staff processes are stressed.

3. FIGHT THE "A WAY" COMBAT ACTION, COLLECT EXPLICIT MOP DATA RELATED TO EACH OF THE SELECTED TASKS.

The "a way" action should be fought by a CTC-validated Battalion Task Force in TES virtual simulation (SIMNET) with all staff positions fully manned. Mission: daylight Defense in Sector. Units should be manned down to Platoon Leader level--individual AFV in Semi-Automated Forces. All direct and indirect fire capability represented by manned or SAFOR AAR conducted for each individual staff officer, staff team and entire Battle Staff.

The MOP/MOE for S2, S3, FSO staff team tasks should be generated routinely as the battalion defense is executed. The challenge will be to assess which battlefield effects,

when, will be most supportive to the staff team training. Since the primary focus is synchronization of firepower, most data collection should be directed at actual target effects of direct and indirect fires. Which weapons actually hit what where? Then there has to be sufficient documentation of planning and execution graphics for both friendly and enemy to permit thoughtful analysis of causes for various target effects. If the fires into the Engagement Area were faulty, why? Documentation should be sufficiently detailed to answer these kinds of questions.

4. WRITE EXPANDED MOP ORIENTED TO THE "A WAY" EXECUTION--IF MOE, EXPLAIN NATURE OF THE EXPERT INTERPRETATION OF MOP WHICH IS REQUIRED.

This should be an exercise in detailed "filling in the blanks" for both Staff Task Proficiency and Battle Staff Effectiveness. Each of the general MOP/MOE listed in Step 1 above relating to S2, S3, FSO team responsibilities in Bn TF Defense, Execution should be expanded using the actual warfight data captured during the warfights conducted in Step 3. Specific amounts, locations, and times should be recorded in detail with all of the source back up cross-referenced for further training use including, whenever possible, visual confirmation through Plan View Display or Stealth Out of Window displays of critical actions. This will be a laborious, time consuming but essential action. The supporting data for those MOP and MOE serving as BSE "probes" need to be collected also.

Examples follow of detailed "a way" MOP/MOE. Assume that the Proponent selected the listed S2, S3, FSO tasks in Battalion Task Force Task Command group operations (7-1-3903)--one of the several tasks which contribute to the fire synchronization task inventory. The general subtask and standard is followed by a sample of the detailed data which must be collected during execution of the mission in virtual simulation. To avoid errors and omissions, each MOP/MOE should have similar documentation of detail provided prior to "a way" execution so that all know what data must be collected in Table preparation in step 5 below.

TASK: COMMAND GROUP operations (7-1-3903)
(FM 71-2, Chapter 2; TACP 51-55)

CONDITION: The TF conducts tactical operations against an enemy. Changes in METT-T require control and coordination actions.
TASK STANDARD:
3. Command group follows the battle.
 - Command group monitors the development of the enemy and friendly situations. Track physical location of Commander, S3, FSO. Monitor timeliness of the

communications flow to the Command Group keyed to the synchronization matrix. Compare planned to actual execution for Maneuver, Fire Support and Command and Control. Time delay for commander knowledge of critical Decision Points? Compare actual actions to planned actions--in time and location for the Fire Support matrix. Compare tactical maps at Bn and Co echelons Cmdr and FSO/FIST.

4. Command group directs the maneuver and fires of combat forces
 a. TF wins the battle.
 b. TF commander controls fire and maneuver of company teams or supporting combat elements by giving FRAGOs to--
 - Correct elements not following OPLAN/OPORD.
 - Change plan to respond to new METT-T factors.
 - Control direct fires on the enemy. In each case track from event causing change (METT-T), to command decision to S2, S3, FSO coordination to execute order to actual execution on the ground (steel on target).
 c. TF commander directs changes in missions/tasks for fire support, ADA, scouts, antiarmor elements, engineer elements, and other CS to respond to changes in METT-T. He controls directly or by instructing the main CP to issue a FRAGO. Record time of event (METT-T) changing, time to unit response decision and time to execution on the ground.
5. FSO coordinates the execution of fire support.
 a. Fire support assists the TF to accomplish the mission and does not fire on friendly forces.
 b. FSO modifies the fire support plan to conform to new factors of METT-T or new guidance from the TF commander. He directs subordinate FSO/FISTs or other elements to engage portions of the enemy formation/positions, or he changes priorities of fires or priority of targets, or he gives other guidance.
 c. FSO directs the FSE to accomplish coordination actions that the FSO cannot.
 d. FSO directs the FAC to request immediate CAS (at least 30 minutes before needed time on target). In each case above, record battle cause to decision to actual execute of order.
6. FAC directs CAS strikes.
 a. CAS strikes contribute to mission success.
 b. CAS does not strike friendly elements.
 c. CAS is directed IAW procedures outlined in TACP 51-55. Record each CAS mission TOT, BDA. Intended effects, actual effects.
7. Command group performs lateral coordination with adjacent/forward battalions
 - Actions of the enemy battalion or other situations that impact on adjacent or forward TFs are quickly coordinated. The command group accomplishes this directly or through the main CP. Monitor coordination--planned and immediate. What coordination actually occurred, when?
8. Command group reports
 a. XO/S3 augments the reports of subordinate elements to keep the main CP informed of the forward tactical situation.
 b. Sends critical reports to the brigade tactical CP. Monitor reports-SOP compared to actual.

5. TRANSLATE THE SPECIFIC "A WAY" MOP TO THE MOP COLLECTION REQUIREMENTS FOR "YOUR WAY" EXECUTION OF THE TABLE OR MODULE

After Step 4, the detailed collection requirement has been established for the Table training exercise for the S2, S3, FSO staff team. The challenge now is to develop a plan to use both automated data collection and trained OCs and OEs to collect the detailed MOP and MOE in a timely manner for the Bn S2,S3,FSO team training. Both Staff Task Proficiency and Battle Staff Effectiveness training support material needs to be prod to support this team training exercise. Once the resulting structured exercise is validated by use in a Proof of Principle, that methodology applies to collecting the MOP/MOE for the training of "your way" S2, S3, FSO team as an element of BCST. "Your way" data could be used "stand alone" in a synchronization training exercise for unit team training or in comparison to the MOP/MOE record of the performance of the S2, S3, FSO team in the "a way" unit. The "a way" team performance data could also be used for institutional training. Future alternatives are discussed in App. 2.4.

This completes the second major element of MOP/MOE development for BCST, the training of the S2, S3, FSO team essentially in direct and indirect fire synchronization. As this material is prepared, a critical team in Airland Battle execution will have a rigorous training program--essentially Battle Staff Experiential Training-Team as advocated by Olmstead. And the methodology described here for horizontal staff team training should be equally applicable for vertical team training.

The last aspect of MOP/MOE development is to ensure that the MOP/MOE required for the entire BnTF BCST have been included in the overall AAR development. The steps employed above for individual staff member (S4 in the example) and small staff team (S2, S3, FSO in the example) are now directed at the overall battalion command staff training.

Battalion Command/Staff Team

This is the finale of the BCST. After the individual staff members and the small staff teams have been trained, it all has to come together, full up, in a table which trains all of the unit command and staff team together. Both Battle Staff Effectiveness and Staff Task Proficiency must both blend to produce a well honed team prepared to fight and win.

1. DEFINE A GENERAL STATEMENT OF THE TASKS, CONDITIONS AND ESTABLISHED STANDARDS FOR THE BATTALION STAFF TO BE TRAINED.

There are two useful sources for tasks which the battalion command staff team must master to execute successfully a defend mission. They are the Combined Arms Battle Task Battalion Task Force, Defend, Execution Phase and the ARTEP-71-2 MTP, *The Tank and Mechanized Infantry Battalion Task Force.* Both have been cited frequently in addressing S4 and S2, S3, FSO small team training. The development process should be clear. The challenge now is to aggregate the tasks developed for all of the individual staff officers and small staff teams to create the whole.

In the Combined Arms Battle Tasks, Bn TF, Defend, Execution and Common phase tasks are (highlighted tasks have been discussed above):

EXECUTION PHASE

68 Conduct Reconnaissance and Surveillance Effort
69 Conduct Counter-Reconnaissance Effort
70 Execute Fire Plan
71 Execute Battle Handover
72 Execute Maneuver Scheme
73 Execute Fire Support Plan
74 Execute Obstacle Plan
75 Execute FASCAM Plan
77 Respond to NBC Operations
78 Execute Decision Matrix
79 Control Supporting Fires
135 Control Air Defense Forces
159 Position Fire Support Forces
160 React to Enemy Air
165 Control Evacuation
167 Maintain Communications
168 Maintain Contact with Adjacent Units
170 Issue FRAGO
175 Control Supporting Units
177 Comply with Commander's Intent

CA Btl Tasks, Defend, p. 47

COMMON PHASE

24 Conduct IPB Process
62 Execute Combat Service Support Operations
76 Utilize Combat Service Support Assets
81 Analyze Combat Information
83 Direct Intelligence Collection Effort
84 Disseminate Intelligence and Combat Information
85 Maintain Operations Security

86 Update Estimate of the Situation
107 Operate Admin/Log Operations Center
112 Operate Tactical Operations Center
178 Report Combat Information

CA Btl Tasks, Common, p. 61.

These task lists are complemented by the defend task in the ARTEP-MTP:

Battalion Task Force TASK: Defend (7-1-3009)

ARTEP 71-2 MTP, *Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 5-33, -34

CONDITION: The TF defends in the forward portion of the MBA. A covering force forward of the TF gives the TF early warning. The covering force withdraws. The enemy performs reconnaissance, breaching, and infiltration to prepare for the attack. The enemy attacks with an MRB(+).
NOTE: This task may be a battle position defense or defense in sector, depending upon METT-T factors.
TASK STANDARD:

a. The TF is prepared to defend at the time prescribed.
b. The enemy MRR is defeated forward (50 percent or more destroyed, wounded, or captured) forward of the battalion rear boundary.
c. The TF performs the defense IAW the brigade commander's intent for coordination with adjacent TFs.
d. There is no penetration of rear boundary by an MRC(+) or more.
e. TF sustains less than 30 percent casualties.

SUBTASKS AND STANDARDS

1. TF commander and staff plan the defense and issue an OPORD that:
 a. Identifies engagement areas along each approach where the enemy is most vulnerable. It provides for positions, weapons, and obstacles to destroy the enemy in those areas.
 b. Breaks up the enemy formation to expose him to flanking fires from multiple directions and to not allow him to fight a linear battle.
 c. Uses full depth of the sector consistent with the brigade commander's concept for synchronization with adjacent TF.
 d. Uses displacement for subsequent positions, which are planned and coordinated with obstacles and covering fire.
 e. Blocks or slows the enemy on all likely mounted and dismounted approaches with enough defending forces and obstacles to allow maneuver forces to mass on the approaches being used.
 f. Provides for flexibility by having depth and contingency plans for shifting fires or counterattacks to mass forces on approaches the enemy actually uses. Identifies decision points to allow initiation of maneuver. Gives the engagement criteria, firing priorities, or engagement priorities.
 g. Has security forces on all approaches sufficient to detect any enemy. Covers the decision point when TF takes over the battle handover line responsibilities.
 h. Positions antiarmor weapons in depth for flanking fires, defilade positioning, and promoting maneuvers against the enemy. Areas assigned should be large enough for positioning.

i. Contains a specific task list for mobility, countermobility, and survivability tasks.
j. Positions infantry to push the enemy into engagement areas and to provide protection for antiarmor weapons and obstacles. Infantry is not positioned where it can be engaged by standoff fires or overrun by mounted assault. Infantry with artillery blocks or secures dismounted approaches and mounted infiltration routes. Designates a trigger line and disengagement criteria.
k. Uses obstacles with defending maneuver forces to turn, slow, and canalize the enemy into areas where he is vulnerable to antiarmor fires.
l. Has sufficient fire control measures to mass and distribute direct fires on the enemy formations.
m. Provides for the defeat of enemy reconnaissance. Security forces are deployed forward, reaction forces designated and local security coordinated.
n. Avoids obvious positioning in concept of the defense.
o. Uses supporting fires to strike the enemy where he is slowed or stopped and against his formations and forces that are vulnerable and critical. Where these fires do not obscure direct fires (normally, overwatching ATGM supporting fires are used).
p. Positions ADA to protect preparations and maneuver.
q. Provides the priority of fires for fire support.
r. Provides the priority of engineer work.
s. Requests CAS from brigade and plans their employment.
t. Provides for emergency resupply/movement of forces by helicopter/vehicles.

2. Battalion TF prepares the defense.
 a. TF priorities of work are completed.
 b. Fighting positions are prepared for all personnel, vehicles, and weapons systems.
 c. Movements are reconnoitered and rehearsed.
 d. Fire plans and sector sketches are prepared.
 e. All required obstacles are properly emplaced.
 f. Preparations do not disclose defensive concept to enemy.
3. TF defeats the enemy reconnaissance and infiltration, and performs surveillance.
 a. Enemy reconnaissance cannot observe the occupation and setup of the defense.
 b. Enemy commander does not determine the friendly scheme of defense. The enemy fire plan cannot suppress the defense.
 c. No friendly obstacles are breached before the enemy attack.
 d. Security elements are far enough out to provide a 10-minute warning to the TF of the arrival of the enemy attack.
 e. Security element can detect and track the movement of the enemy second echelon.
4. TF defeats the attack.
 a. The enemy MRR is defeated forward of the TF rear boundary. There is no MRC or larger penetration of the TF rear boundary.
 b. TF performs the defense IAW the brigade commander's intent for coordination with adjacent battalions. Movements do not uncover adjacent battalion.
 c. TF has at least 70 percent personnel and equipment after consolidation and reorganization, and it can continue its mission.

Note that this ARTEP-MTP task list for the defense includes all aspects of defense. That is, it includes Planning and Preparing as well as Execution as it covers all seven Battlefield Operating Systems. For development purposes, we have examined a relatively small yet important subset of the larger problem of training for Bn defense by selecting Defense as limited to the Execution Phase. The larger problem is considerable.

The AMTEP-MTP lists by BOS all of the tasks included in the five Heavy Battalion Operations--Offensive, Defensive, Retrograde, Recon and Security and Movement to Contact. The defense tasks are (tasks discussed above are highlighted):

MANEUVER TASKS
- Occupy Assembly Area 7-1-3001
- Perform Tactical Road March 7-1-3002
- Perform Passage of Lines 7-1-3003
- Move Tactically 7-1-3004
- Attack/Counterattack by Fire 7-1-3008
- **Defend 7-1-3009**
- Cover Passage of Lines 7-1-3010
- Withdraw Not Under Enemy Pressure 7-1-3011
- Withdraw Under Enemy Fire 7-1-3012
- Delay 7-1-3013
- Perform Relief in Place 7-1-3014
- Perform Linkup 7-1-3015
- Perform Reserve Operations 7-1-3016
- Perform Rear Operations 7-1-3017
- Perform Guard 7-1-3020
- Reorganize 7-1-3022
- Consolidate 7-1-3023
- Perform Screen 7-1-3026
- Maintain Operations Security 7-1-3028

COMMAND AND CONTROL
- **Command and Control the Battalion Task Force 7-1-3901**
- Perform S3 Operations 7-1-3902
- **Command Group Operations 7-1-3903**
- Operate Main Command Post 7-1-3904
- Move a Command Post 7-1-3035
- Establish a Command Post 7-1-3036
- Maintain Communications 7-1-3401

INTELLIGENCE
- Perform Intelligence Operations 7-1-3905
- **Perform S2 Operations 7-1-3906**

FIRE SUPPORT
- **Employ Fire Support 7-1-3907**
- Operate Fire Support Section 7-1-3908

MOBILITY/SURVIVABILITY
- Perform Mobility/Survivability Operations 7-1-3909
- Perform NBC Operations 7-1-3910
- React to a Chemical Attack 7-1-3029
- Prepare for Friendly Nuclear Attack 7-1-3030
- Cross a Chemically/Nuclear Contaminated Area 7-1-3031
- Perform Hasty Decontamination 7-1-3032
- React to Indirect Fire 7-1-3034

AIR DEFENSE
- Perform Air Defense Operations 7-1-3911
- Defend Against Air Attack 7-1-3037

COMBAT SERVICE SUPPORT
Perform Combat Service Support Operations 7-1-3912
Operate Combat Trains CP 7-1-3913
Operate Field Trains CP 7-1-3914
Operate Personnel Administration Center 7-1-3915
Treat and Evacuate Casualties 7-1-3033

Table 2-1 Operation-to collective task matrix, ARTEP-71-2 MTP, pp. 2-3, -5

There is a formidable array of Defend tasks or subtasks in the ARTEP-MTP. Of course, the proponent responsibility is to define the entire universe of possible missions for a globally deployed Total Force. Basic staff training certainly does not require "all of the above." Yet the definition of subtasks for individuals and small staff teams in the ARTEP-MTP is excellent as, we have seen in the S4 and S2, S3, FSO staff training assessments covered above.

After reflection, the methodology of the Combined Arms Battle Tasks appears to be the best development alternative to proof the BCST concept including both Staff Task Proficiency and Battle Staff Effectiveness. Execution of Battalion TF Defense, Execution Phase structured to ensure that the subtasks listed above--the 20 Defend-Execution Tasks and the 11 Common Phase Tasks--are trained in an "a way" warfight should provide the simulation training support necessary to support subsequent development of individual and small staff team training packages which could be based on the excellent subtask and standard detail of the ARTEP-MTP. In sum, develop the MOP/MOE for the prototype BCST AAR-Bn TF, Defend, Execution to support the Combined Arms Battle Tasks, then from that material, prepare the individual and small staff group training support for both Staff Task Proficiency and Battle Staff Effectiveness.

2. DESCRIBE WHAT MUST OCCUR IN "A WAY" WARFIGHT TO CAUSE EVALUATION DATA REQUIRED IN 1 ABOVE TO BE DEVELOPED.

There appear to be few specific requirements which need to be added to a standard CTC-type Battalion Task Force Defense in order to develop the very specific MOP data necessary to create the "a way" AAR. They are:

- The unit should start the operation (Receipt of Mission from Brigade) already degraded from previous operations so that there is no surplus in any BOS. Logistics operations in particular must be conducted throughout the conduct of the defense

- The enemy should be sufficiently capable that even the highly competent "a way" unit is required to modify its plans substantially during execution of the defense so that all staff processes are stressed.

3. FIGHT THE "A WAY" COMBAT ACTION, COLLECT EXPLICIT MOP DATA RELATED TO EACH OF THE SELECTED TASKS.

The "a way" action should be fought by a CTC-validated Battalion Task Force in TES virtual simulation (SIMNET) with all staff positions fully manned. Mission: daylight Defense in Sector. Units should be manned down to Platoon Leader level--individual AFV in Semi-Automated Forces. AAR conducted for each individual staff officer, staff team, and entire Battle Staff.

For construction of the Table BnTF Defense, Execution, all command/staff actions of the Execution Phase--from when the attacking force begins movement forward from the assembly area until a new mission is assigned the unit--should be recorded including tactical reports, map overlays, communications nets, interpersonal orders, and coordination relevant to MOP, etc., for line companies and all HHC platoons, Command Group, TOC, and ALOC. OC and OE collect actual execution data in response to the doctrinal tasks and organizational processes selected for training above in Step 1. All training should be recorded including AARs of both Staff Task Proficiency and Battle Staff Effectiveness of individual staff officers (S4, etc.), small staff teams, and the unit as a whole.

The unit should be prepared to execute three full repetitions of the mission to constant initial METT-T from receipt of the mission warning order from Brigade to assignment of the next mission with full documentation as described above. Note: For purposes of concept development, full documentation is necessary only for the Execution Phase. Considering the effort required to secure this, it may be desirable to collect data for Planning and Preparation as well. Then all of the necessary documentation will be available for subsequent completion of all phases of defense without having to reassemble the "a way" experienced Battalion TF.

4. WRITE EXPANDED MOP ORIENTED TO THE "A WAY" EXECUTION--IF MOE, EXPLAIN NATURE OF THE EXPERT INTERPRETATION OF MOP WHICH IS REQUIRED.

This should be an exercise in detailed "filling in the blanks." Each of the general MOP/MOE listed in Step 1 above relating to Bn TF Defense, Execution, should be expanded using the actual warfight data captured during the warfights conducted in Step 3

above. Specific amounts, locations, times should be recorded in detail with all of the source backup cross-referenced for further training use including whenever possible visual confirmation through Plan View Display or Stealth Out of Window displays of critical actions. Again, "Probes" are collected as required to train Battle Staff Effectiveness.

For examples of what the detailed MOP/MOE should consist of, review the S4 and S2, S3, FSO MOP/MOE discussed above. They are representative of what needs to be planned in advance as a collection plan for each staff officer and staff team. To avoid errors and omissions, each MOP/MOE should have similar documentation of detail provided prior to "a way" execution so that all know what data must be collected in Table preparation in step 5 below.

5. TRANSLATE THE SPECIFIC "A WAY" MOP TO THE MOP COLLECTION REQUIREMENTS FOR "YOUR WAY" EXECUTION OF THE TABLE.

Step 4 validates the detailed collection requirement for the Table training by creating very detailed MOP and MOE which focus "your way" AARs. In other words, you (commander or staff member about to execute the Table "your way") know in great detail what will be trained and evaluated during Table execution. Structured BCST training in both Battle Staff Effectiveness and Staff Task Proficiency has been not only constructed but also "a way" has been demonstrated in virtual simulation for your use. In effect, solid, immersing, exciting BCST has been "scripted" for distributed use.

The challenge now is to develop a plan to use trained OCs and OEs to follow the "script" consistent with command training requirements. Collect the detailed MOP and MOE for "your way" execution so that it can be compared with "a way" execution in timely AARs. Once the "a way" structured Battalion BCST exercise is validated by use in a Proof of Principle, that methodology applies to collecting the MOP/MOE for the training of "your way" individuals and staff teams team as an element of BCST. After executing the Table "your way," this training support material could be used "stand alone" in local training exercises for unit individual or staff team training. The building blocks--MOP and MOE--are all there for exciting distributed BCST to standard.

APPENDIX 2.4

AAR TRAINING SUPPORT

APPENDIX 2.4
AAR TRAINING SUPPORT

Successful BCST will require a broad range of MOP and MOE to accommodate not only task training required by doctrine (Staff Task Proficiency) but also the training in organizational competencies (Battle Staff Effectiveness). Appendix 2.3 outlines the process to determine the various MOP/MOE and provides several examples. The "levering" capability enabling highly effective and efficient BCST is use of the MOP/MOE in the conduct of effective AARs after intense warfights in Tables or Modules. The quality of the AAR will be determined by the ability of the TES to actually provide timely MOP/MOE detail in an interesting, relevant way.[1] AAR training support is the "long pole in the tent" to achieve the kinds of sophisticated, distributed training support required for effective BCST for the Guard.

Objective AAR training support for BCST should have several characteristics. It should:

- be absolutely responsive to the requirements of the BCST training developer. Virtual simulation can manipulate objects in four dimensions--locale (position on x, y, z axes) and time (fractions of seconds). An analogy to sports television has already been made. The NFL has mastered Instant Replay to explain plays. Now, drawing on Intelligent Forces (IFOR-improved Semi-Automated Forces), it should also be possible to Fast Forward too. This would not only be to accelerate the passage of time in a previously recorded event (warfight) but also to accelerate the flow of a battle occurring for the first time after there has been some "what if" change in METT-T of the original

1 This paper assumes that virtual simulation will be the primary training support at least for the initial development of BCST. It will be available on a distributed basis to support small unit training, Company and below. It (SIMNET) is readily available for training development purposes. By its nature, it can provide immersion training to distributed locations. This is particularly important at Battalion and below, which is the major Guard BCST training challenge. Clearly good BCST can be supported by subsistent simulation (MILES) in the form of CFX and FTX in a CTC-like AT site. However, this is very expensive in funds and time and the infrequency of training opportunities erodes the training value. Constructive simulation (JANUS, CBS, or BBS) is also useful and may be the best long-term simulation vehicle for BCST, but it does not yet provide the immersion of visual cueing. The longer term BCST training support seems likely to be a combination of virtual and constructive simulations.

action. Time acceleration (or compression) is also necessary to permit convergence of different planning cycles to assess performance. The most obvious example of this is fire support coordination, either vertical or horizontal. Artillery requires one envelope of lead times, Close Air Support another, Attack Helicopters a third. Acceleration of planning leadtimes is necessary to assess MOP associated with integrated employment of these three means of effective fire support. Knowing the MOP, MOE and the desired Table, the trainer should be able to impose a variable planning tempo to ensure that all critical events have occurred during the time span of the Table or Module. The training developer (Proponent) should have the freedom to produce data for required MOP/MOE by varying one or more of the four dimensions. And all must be able to be captured automatically or manually readily by the chain of command, OCs or OEs.

- be equally responsive to the needs of the Guard unit in training. Preparation for and then Table or Module execution should be possible in whatever mode is best suited to the training needs of the unit. If the chain of command desires to gain access to the virtual Table battlefield from AFV in a field locale (WET site or Local Training Area) that should be possible. Conversely, if the requirement is BCST with the command staff group assembled in one or several armories that should also be possible technically. Mastering Staff Task Proficiency should be possible with the unit distributed. It may not be possible to train Battle Staff Effectiveness, particularly team organizational processes, unless the team is collocated. That needs to be determined by TEA.[2] Similarly, much of the unit AAR gains its effectiveness from the interaction of the participants. Eyeball-to-eyeball contact may be necessary. But that is a training question. Technology should enable full distribution of BCST to at least the small staff teams if not to individual staff members.
- be replicable to an acceptable level of resolution distributed to armory, civilian work site or home for individual or small team training. Locale of the AAR should not be a consideration in determining the feasibility of a particular BCST program.
- aggregate the necessary information for the "your way" AAR within 15 minutes after the completion of the "your way" Table exercise. This may seem unreasonable; it is essential due to the short length of the Guard training period--the Unit Training Assembly (UTA) of four hours duration. The vast majority of that 4-hour period should be spent either "fighting" or participating in the AAR, not in standing by as data are collected.

2 There is a similar research challenge for teams formed in vertical BCST.

- be able to "automatically" acquire, process, and distribute information supporting preestablished MOP--i.e., automatically gather the data to convert an "a way" MOP collected during the "a way" warfight (Table/Module) to "your way" MOP for "your way" AAR purposes. Alternatively, "automatically" convert a decision matrix or synchronization matrix to a three-dimensional virtual display which compares actual execution with what was planned in the matrix. These "preplans" (vertical or horizontal AAR Modules) should be able to be inserted into a "your way" AAR as readily as METT-T can be varied for the "your way" Table itself. That is, the "automatic" AAR collection process should be able to be modified with the same lead time that is required to modify the Table itself by varying METT-T. Development priority, however, should go to preparation of a superb basic "a way" Table and AAR which supports the training-effective "your way" Table and Module and subsequent AAR to the same METT-T as the "a way" Table.
- be capable of integrating "out of window" visual (Stealth) displays; "Bird's eye view displays" (Plan View Display [PVD]); tabular data such as killer-victim scoreboards; communications net content (voice or data); recordings of conversations such as planning guidance from Commander to S3; and pictures of maps with overlay graphics at various times. Information to be collated and "packaged" as a "preplan" specified by the chain of command, OC or OE at least 24 hours before the initialization of the Table for unit training. In other words, be able to create, then use, an absolutely new MOP in a modified Table and subsequent AAR within 24 hours.

NOTE: These requirements may appear unreasonable if not utopian. Remember there are two AARs. One is the AAR of the "a way" unit. This AAR is prepared by the Proponent when the "A way" Table is fought to standard presumably at a CTC or at a school. There are no time constraints on preparation of this AAR which becomes the model or software "pattern" for the "your way" AAR. Then think of the AAR as a collection of MOP modules (software applications) proofed in the "a way" Table/Module and subsequent AAR. And there is a recommended sequence for using these modules to train. That sequence is what is provided by the Proponent as the "a way" AAR which will be available for the training use of the unit before it initializes its "your way" Table/Module with associated AAR. Most of the AARs described above are "your way" AARs which compare "your" performance to that of the highly competent "a way" unit. Thus the "your way" AARs should be largely "fill in the blanks" to show differences from the appropriate "a way" AAR and to explain "why".

It seems certain that current AAR collection requirements will change substantially. When trainers think through individual and small team proficiency, new questions will

arise. As primary data are captured in virtual simulation, there is an immediate, predictable and useful requirement to correlate the data with the tactical action that cued the behavior. For example, as the S2, S3, FSO staff team trained in direct and indirect fire synchronization, new cross BOS tasks became evident. Similar insights (new MOP) will arise within and between other BOS. This growth began to emerge as SIMNET developers contemplated new training opportunities as SIMNET began to grow to Battalion and Brigade echelon operations. An important collateral (cross BOS) operation is the suppression of enemy air defense (JSEAD). It was quickly realized that a thoughtful AAR of JSEAD would probably want to :

(a) display
- CAS strikes and SEAD targets graphically,
- Enemy ADA locations and times of SEAD strikes,
- Actual SEAD target effects,
- Enemy radar and air defense weapon coverage and friendly jamming
- What happened in a cause and effect relationship.

(b) Calculate attrition of friendly and enemy forces over time.

(c) Calculate friendly losses to various enemy weapon systems over time by sector; compare losses against effective SEAD and against ineffective or less than effective SEAD.

(d) Show enemy artillery locations and compare with friendly plots of suspected enemy artillery locations.

These data can only be derived by correlating data derived from the target acquisition battery SAF (SemiAutomated Forces) workstations with data received from the EW, maneuver, air SAF workstations, and manned systems as well.

Gary Bloedorn, "The After Action Review,
SIMNET COMMAND MODULES,
17 March 1989, p. E2-11

For every operation which crosses BOS to achieve effects, there will be similar, and highly beneficial, expansion of thoughtful questions which will require considerable data correlation to produce useful MOP and AARs. AAR training support should be designed as much for the questions that have not been asked as those that have. Proponents and CTC leadership can provide useful insights here particularly as vertical BCST launches. Significant expansion capability will be essential.

Similar expansion will result from the focus on Organizational Competence. A criterion for assessing the quality of Stabilizing is:

Appropriateness--Timing is appropriate in view of the situation, conditions and intended effects. Choice of target of the action is appropriate.[3]

This is a very subjective MOE. It requires a well-trained OE prepared to counsel the appropriate staff officer. And it requires considerable data collection and correlation both to judge what is "appropriate" under the circumstances and to document the judgment to the target audience. What were the alternatives, who realized them, what decision latitude was present? Tough data requirements. Collecting challenging MOP and MOE appears about to become a "growth industry" in Army training as BCST becomes more sophisticated.

Training support to collect and present these must be equally adaptable.

Fortunately, virtual simulation has more data collection capability available today than most realize. An assessment of AAR MOP/MOE potential was made in 1989. Without post processing, the following was available:

S U M S

Total losses by system
Total survivors by system
Total shots by system
Total shot by type
Kills by type/by shot
Total kills
Ammo expenditure by wpn
Total hits taken by system
Total hits at 0 deg aspect
Total hits at 15 deg aspect
Total hits at 30 deg aspect
Total hits at 45 degree aspect
Total hits at 90 degree (flank of vehicle)
Total hits at 180 deg aspect (vehicle rear)

Location and Movement

Location of selected vehicle over time
Distance from one vehicle to another over time
Time that a vehicle crosses a geographic boundary
Distance from vehicle to a geographic point over time
Distance travelled between selected times

Speed

Speed of selected vehicle over time
Average speed of vehicle
% of time vehicle is moving
Speed when firing
Speed when hit
Height AGL when firing*
Height AGL when hit*
* As appropriate to Army Aviation systems.

3 Olmstead, *Battle Staff Integration*, pp. C-3, C-4.

M A P S

Map of vehicle's movement over time
Map of unit's movement over time.
Map of vehicle's firing over time

Logistics

Fuel use between selected times
Ammo use over time by vehicle
Ammo use over time by unit
Major end Xem replacement
Personnel replacement by MOS, grade and unit
Casualties by type, time, MOS, grade and unit
Evacuation of wounded by type wound, MOS, grade and unit

Visibility

Inter-vehicle visibility over time
Time interval from first intervisibility to opening fire
Range at first atkr-tgt intervisibility

Workstation/Device Usage

Number of times a button or option is selected
Number and time a report is sent manually
Number and time an automated report is sent
Number of reports in queue over time-manual and auto

With post processing, the following is available:

Sums

Avg open fire range
Avg hit range
Avg kill range
Avg rg of hits taken
Avg loss range
Engagement firer/tgt prs
Rds per engagement
Rds per mission (battery)
Total mines employed
Total sys des by mines

Ratios

Loss ratio
Survivor ratio
Hit rate
Kill rate
Rds per kill
Specific exchange ratio
Tgt acquisition per tgt avail
Tgt acquisition vs tgt eng
Sys des vs mines employed

Force Ratios

Loss exchange ratios
Force exchange ratio
Surviving force ratio differential
Range distributions
Range distribution of direct fire engagements
Range distribution of direct fire hits

Range distribution of indirect fire engagements
Range distribution of indirect fire engagements

Time Distributions

Kills over time
Cumulative kills over time
Time distribution of indirect fire engagements
Losses over time
Cumulative losses over time

These MOP have application to most of the BOS although Maneuver, Fire Support, Command and Control and Combat Service Support predominate. Note, however, that these are all automated data collection produced with or without post processing. A serious deficiency now is the inability to reflect tactical decisions on a common timeline. When was the change in mission directed? Nor is there any automated content analysis of communications--voice, data or overlay. When was the patrol information received?

Critical AAR elements are missing from the SIMNET data collection capability unless there is a manual data collection effort. Fortunately, there is. The Guard training strategy foresees OCs and OEs to be present to support the AAR effort. In addition, the AAR is not a "one time, cold start" event. Remember, we are describing the use of Tables and Modules with much of the training benefit derived from the "a way" Table and "a way" AAR which are provided to the unit and the OCs and OEs as a package for pretrain. Knowing the Table and the design of the "a way" AAR, training support personnel know exactly where they have to supplement the automated data collection effort to produce the "your way" AAR. Clearly there is additional work required to produce greater automated AAR training support along the lines suggested earlier. But equally clearly, many of the MOP and MOE postulated in Appendix 2.3 can be collected today by employing a combination of automated and manual data collection once the specific Table and associated training packages for the Proof of Principle are determined.

Another challenge in training support for AARs is cost reduction so that AAR data generation capability can be widely distributed. Good work is being done to PC-base AAR data collection. ARI Knox and Orlando have collaborated to produce a solid start, the Unit Performance Assessment System (UPAS).

THE PROTOTYPE UNIT PERFORMANCE ASSESSMENT SYSTEM (UPAS)

ARI and Perceptronics developed a low cost, personal computer-based (PC-based) Unit Performance Assessment System (UPAS) to assist in collecting and analyzing data from SIMNET exercises. UPAS collects virtually all of the data broadcast over the network for subsequent analysis on a stand alone

basis. The prototype UPAS contains two types of tools to support training feedback and research.

First, UPAS loads data from the network into a relational database, and provides a menu-based system of editors for creating graphic and tabular summaries of unit performance from these data. The design of the database is based on the NTC database to support research on collective training strategies. Second, the prototype contains a Plan View Display that can be used to replay the mission or critical segments of the mission from a bird's-eye view. In addition to showing vehicle location, vehicle orientation, and weapon system orientation over a grid map, the PVD indicates when each vehicle fires or becomes a casualty. This prototype UPAS includes the capability to magnify the battlefield to the point where the entire display covers an area that is only one kilometer square.[4]

Innovative improvements have been made recently:

NEW UPAS AAR AIDS

The PVD was modified to support training feedback and research more effectively; and three new types of AAR aids were implemented. The quality of illustrations of the AAR aids are limited due to a lack of SIMNET exercise data.... The capability to display major terrain features (i.e., highways, unimproved roads, tree lines, tree canopies, buildings, and bodies of water) was added to the Plan View Display. These features are all color coded in the display. In addition, a quick search capability was implemented to allow the user to move quickly forward and backward to particular points in an exercise, and the capability to magnify the battlefield was enhanced to allow sections as small as 200 meters by 200 meters to be displayed.

A Battle Flow Chart was implemented to trace the movement of vehicles from bird's-eye view at specified intervals throughout the course of a mission... The Battle Flow traces movement over a grid map displaying unit control measures taken from the unit's operations order. The user can start or stop the trace of unit movement at any point in the exercise, and thus a copy of the trace can be made for selected portions of the exercise as well as for the entire exercise. Unlike the Plan View, the Battle Flow indicates vehicle location but does not indicate vehicular and weapon system orientation. The Battle Flow, like the Plan View, allows the user to magnify the battlefield.

A Battle Snapshot is another tool that shows the position and orientation of vehicles and weapon systems from a bird's-eye view. A Snapshot can be taken of any point in the exercise designated by the user. Like the Plan

4 Meliza, Larry L., and Seng Chong Tan, *Application of the SIMNET Unit Performance Assessment System to After Action Reviews*, ARI TRADE Paper, undated (1991), p. 3. More extensive capability is available in the SIMNET Datalogger; however, this capability has been associated with combat development, not training development or general force training. UPAS is the first training support aimed explicitly at low cost support of AAR of small unit training in virtual simulation. It needs to be tied to ongoing training analyses at the CTC.

View and the Battle Flow, the Snapshot allows the user to magnify the battlefield. Like the Battle Flow, the Snapshot shows the location of vehicles on a grid map that includes control measures.

An **Exercise Timeline** is a tool for looking at temporal coordination of movement, firing events, control measures, and communication. The top and bottom lines cover the time during the exercise. The second line describes movement of the platoon as a function of time and unit control measures. The bars at the bottom of this line indicate the time when the first and last vehicle of a unit crossed a control measure. The Timeline also indicates the beginning and ending of periods in time when the entire platoon was halted. The third line provides information about the time of direct and indirect firing events. A small square is used to indicate a point in time when the unit receives artillery fire, and an arrow pointed down indicates when the first enemy direct fire was received by the unit. A small circle is used to indicate a point in time when a friendly vehicle is destroyed. An arrow pointed up indicates when the unit first delivers fire on the enemy, and a small x indicates points in time when an enemy vehicle is destroyed.

Larry L. Meliza and Seng Chong Tan,
Application of the SIMNET Unit Performance Assessment System to After Action Reviews, pp. 5-8

Notice how the Exercise Timeline uses existing data to create a useful timeline. Their work reflects the essentially maneuver orientation of current SIMNET use. Similar innovation directed at other BOS should produce AAR capability expanded to other BOS in months.

Most of the preceding AAR training support discussion has conformed to the current AAR model confirmed over the years for unit training in the CTC. That may provide useful precedence for future individual and small team training but the odds are not favorable. The power of immersion in virtual simulation is practically untapped for distributed individual training. Once the "bread and butter" Tables--such as Battalion TF Defense--Planning, Preparation, and Execution [three Tables]--are created, the training developer should strive to draw on "canned" synthetic battlefield warfights to create individual or small group distributed training vignettes or Modules. In other words, the S4 should be trained in increasingly challenging situations requiring him or her to demonstrate task and organizational process proficiency.

The development model could be the sophisticated training matrix of the AFV Conduct of Fire Trainer. Think of the S4 (or the S2, S3, FSO team) facing increasingly challenging learning situations in interactive virtual simulation and provided practically immediate feedback as the Abrams or Bradley Gunner is today in the UCOFT. The S4 would be provided a personal "porthole" to the virtual battlefield where the "a way"

battalion is fighting. Alone or in conjunction with his small staff team (XO, S1, S4), he has to respond to "canned" situations drawn from the ongoing warfight. All the known "Tricks of the Trade" of the AAR are built in but they have been adjusted to the immersion potential of virtual simulation. And hopefully development of Organizational Competence could be "built in" to doctrinal task training.

AAR training support for training of individuals and small teams in virtual simulation is in its infancy. The potential for order of magnitude improvements is immense.

APPENDIX 2.5

THE OBJECTIVE AAR

APPENDIX 2.5
THE OBJECTIVE AAR

The AAR is the central training focus of BCST. Preparation for and successful conduct of the warfight Table or Module is the stimulant to professional interest and competence but the training vehicle is the AAR. Professional pride, competitiveness, and natural curiosity combine to make the AAR a premier training event in the Army training system. Therefore, the maximum leverage in BCST is to be gained by creating the most effective and efficient AAR possible. The purpose of this Appendix is to describe what the objective AAR should be for maximum training benefit. It is to project the "mark on the wall" to focus following technology and training development.

Parts of the "mark on the wall" will be executable tomorrow, others are probably a decade away in technology development. In preceding Appendices, we have discussed current training development (App. 2.1, AAR Training Development); developed what BCST is to train and how the training program is to be prepared (App. 2.2, Task Checklist for AAR Design); determined how the MOP and MOE should be developed for the various training audiences (App. 2.3, MOP/MOE Development); and defined what must be developed to provide the necessary training support to the AAR (App. 2.4, AAR Training Support). We have defined the constituent parts. Now as we define how it all is to come together for various training requirements, we complete the detailed conceptual vision of the AAR.

If we could create the "perfect" or objective AAR for Army training and particularly for distributed Guard training, what would it be? The objective AAR should:

- Follow the general content and sequence proved during the past 15 years in the Combat Training Centers. The current ARTEP-71-2 MTP describes the process well for the maneuver heavy battalion:

 g. After-Action Review
 (1) A series of AARs are conducted from battalion level through platoon level. This provides the full benefit of active participation and informative feedback. The size of each group level should be tailored to enhance learning. The key to AARs is interaction of people; AARs should not be a lecture. The following is a sample format:

(a) Review the brigade mission intent/concept.
(b) Give a brief summary of the sequence of events and what happened.
(c) Review friendly plan.
(d) Review OPFOR plan.
(e) Review planning and preparation for battle in terms of the operating systems, using the AAR collection charts.
(f) Review the results of the operation, using the AAR collection charts.
(g) Review the execution of the operation in chronological order.
(h) Discuss results in terms of the seven operating systems (weak points and ways to improve performance), using the AAR collection charts.
(i) Summarize.

(2) Chief observer/controller guides the AAR. One method of starting the AAR is to ask each participant what went well and what needs improvement. These points should be listed on a chart or butcher paper to help facilitate the discussion. The OPFOR commander or representative should explain his order and plans for the operation as well as any observations on how to improve TF performance. This allows the TF to see what they were fighting against and why some of the actions happened. The chief observer/controller states what happened (facts), and then asks why it happened. Each participant learns from the others and from his leaders. All players work together on identifying and correcting weaknesses. In this way, there is more involvement in their own professional development. The sequence should follow the flow of the battle and focus on the battalion performance. Normally the brigade commander summarizes the final comments at the end of the AAR.

(3) Platoon, company, and system (main CP, combat trains CP, field trains CP) AARs are conducted before or after the battalion AAR and follow the same sequence of events. Operating systems AARs are normally conducted at least once during or after the exercise with the principal operators of the operating systems to work out the details of improving that system's performance. An example would be the FSO, FSE, mortar platoon leader, and FIST chiefs with company commanders and S3s for the fire support system or XOs, support platoon leader, first sergeants, FSB staff, BMO, medical platoon leader, and S1, and S4 for the combat service support system.

(4) At the completion of the AARs, all soldiers and leaders/staff in the TF should know what they did, areas that need improvement, and how to improve....[1]

[1] ARTEP 71-2-MTP, *Mission Training Plan for The Tank and Mechanized Infantry Battalion Task Force*, October 1988, pp. 6-14, -15.

The training principles embedded in this AAR process are solid. Remember, however, that this AAR was designed for AC units fighting on equipment assembled at a Major Training Area, preferably a Combat Training Center. A corps of well-trained OCs train and evaluate at each echelon. The OPFOR is well trained. If training is at a CTC, elaborate training support has been provided. Last, and perhaps most important, this unit collective training event is supplemented by extensive leader, individual and collective unit training which precedes and follows the Field Training Exercise this AAR is designed to support.

The Guard has to make much broader use of the training experience reflected in the ARTEP-MTP model AAR. For example, to conserve resources, particularly time, the AAR should support individual and small team training as well as unit collective training. For a graphical representation of the larger training requirement, see Enclosure 1, App. 2.5. The point is that the conventional AC AAR is excellent for its AC purposes. But it is a floor, not a ceiling, for the Guard, which must get more "mileage" out of the AAR, given fewer alternative training opportunities. Expect modifications for Guard needs such as multiple individual and collective training audiences, grouped and distributed training, and very high and very low technology distributed training support available. And, as indicated at Enclosure 1, the training requirement expands rapidly. The Guard AAR needs to be much more efficient and effective than the AC AAR.

- Have very flexible composition so that it can be tailored to be responsive to as many users as possible. It should be flexible in numerous ways. The BCST AAR may occur in a CTC, or a Guard Major Training Area, or in a Battalion Armory, or with the Battalion Headquarters and subordinate units spread over several hundred square miles. The AAR may be conducted for the commander with the entire staff--the CTC analog--or it may be for an individual staff officer (S4 in example) or small staff team (S2, S3, FSO in example) with primary focus on Staff Task Proficiency or Battle Staff Effectiveness or both. The training may be conducted with or without OC or OE support. Clearly the objective BCST AAR may be used to support individual and leader training whether conducted in the institution or unit.
- Be amenable to various presentation training support media. TES virtual simulation (SIMNET) is clearly preferable because it immerses the unit staff in warfighting. But the available BCST training support may be ARTBASS, BBS or even JANUS. To facilitate exported use, some of the "a way" AAR may be on CD ROM, TV tape, audio tape of various communications nets or other training support such as transparencies of tactical maps with overlays, and various matrices reproduced for local projection. The point is that the

AAR tied to BCST Table or Module must be amenable to the broad range of presentation technologies present in the Guard training environment. However, development priority should go to TES (virtual simulation supplemented by constructive simulation) supported by current media such as CD ROM, which advantage accelerating commercial advances in communications, education and entertainment.

- Be modular. It seems evident from the discussion above that the BCST AAR should be designed in modules such that the final product can be tailored for the various training audiences.[2] Several possible modules which draw on the CTC experience are listed below. Where the primary focus is individual task proficiency--Combined Arms Battle Tasks--an Observer/Controller (O/C) is shown as mentor or facilitator in support of the unit. When the focus is the organizational processes--Organizational Competence--an Organizational Effectiveness Subject Matter Expert (OE) mentors or facilitates for the unit.

POTENTIAL AAR MODULES

The range of potential AAR Modules is extensive. Below is a possible array which could be required to train the entire staff.

- OPFOR discussion of plan, then OPFOR execution in general. Sub-modules address each BOS. For BOS modules, discuss OPFOR plan and execution at Regt and Div. 8 Modules OC mentor.
- Ten-minute summary of entire "day of battle" with emphasis to time period covered in the Table being fought. 1 Module OC mentor, 1 Module OE mentor.
- Summary of action then performance data by MOP/MOE for each of the seven BOS. 7 Modules OC mentor.
- Summary of events, then performance data by MOP/MOE for each staff position (XO, S1, S2, S3, S4, FSO). 6 Modules OC mentor, 6 modules OE mentor.
- Summary of events, then performance data by MOP/MOE for each staff team (S2, S3, FSO; S1, S4, BMO (XO?); S2, S3, ADA; S3, FSO, Engr). 4 modules OC mentor, 4 modules OE mentor.

[2] The discussion focuses on horizontal BCST. The same rationale prevails for vertical BOS; however, the substance would be confined to MOP/MOE of a BOS conducted with personnel from units at multiechelons but responsible for that BOS at each echelon. Creating team Battle Staff Effectiveness will be challenging.

- Table Excursions: Discussion of special aspect of Table such as implications of heavy/light or joint forces support or combined operations with allies. TBD. Assume 3 Modules OC mentor, 3 Modules OE mentor.

TOTAL Modules: OC: 29, OE: 14.

GRAND TOTAL: 43 Modules prepared by various TRADOC Proponents or OE Subject Matter Experts.

NOTE: The grand total could be greater if modules are created for both "a way" AARs (prepared by Proponent) and some lesser number of "your way" AARs prepared on site in response to unit requirements. The "your way" modules could be not only descriptive of what happened and why; they could also describe or prescribe remedial training to correct deficiencies. For examples of cross-applications of potential modules, see Encl. 2, App. 2.5.

Those characteristics define an AAR that could be quite similar to those currently at the CTC. They could also define tens of other potential AARs dependent upon the nature of the BCST training requirement. This should not be surprising. It reflects the very considerable training potential of TES matched with the diversity of the Guard requirement. Clearly there is a major opportunity to improve the training readiness of the Total Force. Several of the combinations are reflected at Enclosure.

Several insights stand out. The power of the technology of virtual simulation combined with the ability to distribute "warfighting" provides unprecedented opportunity to train BCST. "A way" and "your way" execution of the Tables and AAR were developed to provide the unit in training an opportunity to observe "how to" either in preparation, AAR or follow up remedial training. In actuality, they are far more. Packaged by Subject Matter Experts, fought in virtual simulation, and distributed with sophisticated training support to both train and evaluate MOP and MOE, the "a way" AAR modules have unlimited potential in support of individual as well as unit training. They could be comparable to the TRADOC Common Teaching Scenario but with tactics, techniques, and procedures captured in great detail. Could these "warfighting" modules in virtual simulation be at the heart of the "warfighting" OAC or C&CSC in the future? Both resident and distributed?[3] And there is potential for "a way" to be entirely descriptive; "your way" to be not only descriptive but also diagnostic and perhaps prescriptive for remedial training. So there would seem to be high payoff for preparing the "a way" AAR modules. Validation of the

3 This aspect of institutional training is discussed in Chapter 6.

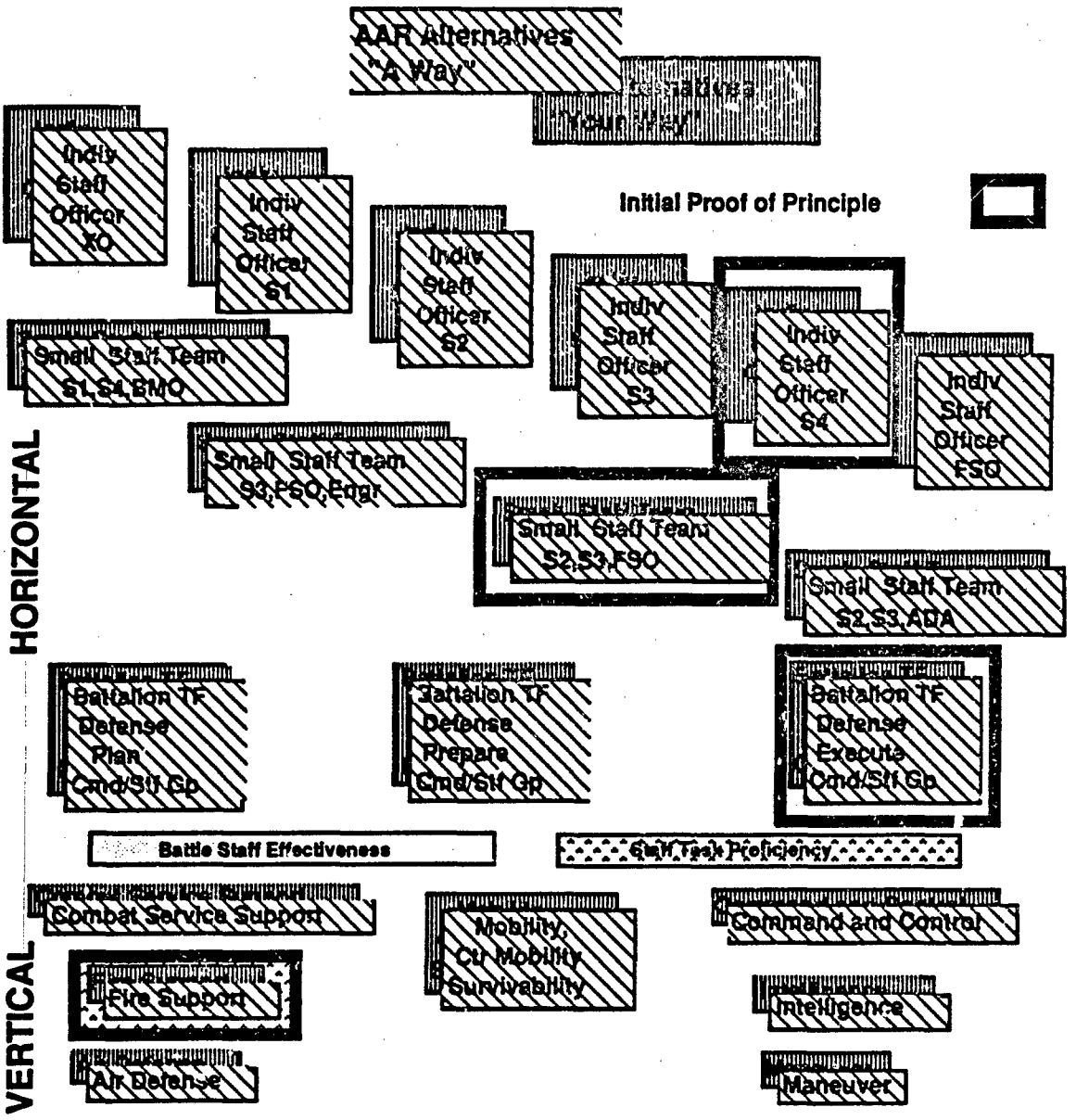
"your way" AAR module potential and requirement awaits Proof of Principle and Training Effectiveness Analysis.

The second insight is that proper preparation of the Tables and AAR will be critical to realizing the potential of BCST. It is more than a "garbage in-garbage out" issue. The x, y, z, t documentation permitted by Datalogger capture of a Battalion fight provides higher resolution documentation of doctrine, tactics, techniques, and procedures than has ever been possible. The training benefit of 73 Easting in SIMNET pales in comparison to a Battalion fight set up with a competent unit to demonstrate "a way" across all BOS in exquisite detail. Preparation and documentation of several Tables/AAR on Brigade or Battalion Defense and Attack should provide the finest BCST training support ever produced. Two sets of Tables/AARs--deliberate attack and deliberate defense--would probably be sufficient. Having completed that, units could proceed to normal STX training per FM 25-101.

Think of BCST AAR potential described here as better than the finest training film you have ever seen--better, because it is interactive. You become part of the "film." You could "what if" and you could see in great detail how "the pros" do it. And you could distribute it throughout the nation with absolute quality control built in as with the UCOFT.

So what is the Objective AAR? It is a family of AARs tailorable to the diverse needs of Staff Task Proficiency and Battle Staff Effectiveness training. All of the AAR are grounded in several well-documented warfights in virtual or constructive simulation and all are structured by the Proponent to support distributed BCST to standard.

Enclosure 1, Appendix 2.5



TO: BCST TRAINING

FROM: Staff AAR after Bn TF STX/FTX

Enclosure 2, Appendix 2.5

AAR: Application of Modules

Training Audience → / AAR Sequence ↓	TRADITIONAL	BCST Bn Horizontal	BCST Staff Team	BCST Staff Officer	BCST Vertical
	Bn Defense FTX	Bn Defend Execution	S2, S3, FSO	S4	Fire Support
	Friendly Plan	SAME-limited to Execution	Same-limited to synchronization	Same-limited to S4 CSS	Same -limited to FS BOS
	OPFOR Plan				
	Planning/Prep by BOS				
	Results: AAR Collection Charts	Detailed MOP and MOE	Detailed MOP and MOE	Detailed MOP and MOE	Detailed MOP and MOE
		Defense Execution	S2, S3, FSO	S4	Fire Support
	Describe execution in order	SAME-limited to Execution	Same-limited to synchronization	Same-limited to S4 CSS	Same -limited to FS BOS
	Discuss results by BOS				
	Summarize				

The Result: Tailored Training Modules for Individual and Collective, Unit and Institutional Staff Training Applications

APPENDIX 3.1

TABLE TRAINING SCENARIOS

APPENDIX 3.1
TABLE TRAINING SCENARIOS

In Appendix 2.3, we described the process for generating the warfighting MOP and MOE which are the essential training support for BCST. Now we are concerned with the design of the Table or warfighting experience--the snapshot of a "day of battle"--which will cause the desired training to occur in the AAR. The Table itself should be designed to stimulate the immersion environment permitted by training in virtual simulation. It should create a situation which is interesting, challenging, even exciting to the staff participant in order to facilitate immersion. Also, it should serve as a logical, consistent "stage-setter" providing credibility to "cues"which need to be created to cause the desired training to occur.[1]

Cues are the dominant and essential product of executing a Table.[2] The Table is designed to create a series of cues which will stimulate staff action, or inaction, directly and specifically related to prescribed MOP or MOE from the individual staff member, small staff team or entire battle staff. Cues may range from a specific enemy action designed to stimulate S2/S3 interaction required for Staff Task Proficiency as prescribed in the ARTEP-MTP to friendly spot report inserted to trigger a "probe" assessing Battle Staff Effectiveness--coping actions.[3] **Creating proper cues is the purpose of the**

1 Tables are intended to complement Situational Training Exercises (STX) in the Army training support inventory. STX require collective task performance to condition and standard in execution of likely warfighting missions. Tables enable STX by requiring performance to task, condition and standard with explicit Mission, Enemy, Terrain, Troops and Time Available. Tables are particularly useful in enabling distributed training to comparable standard now that Tactical Engagement Simulation permits precise distributed replication of METT-T. For extended discussion of Tables, see Enclosure A, Tactical Tables, to "A Simulation-Based Intensified Training Readiness Strategy for the Reserve Component," IDA Paper P-2611, December 1991.

2 The discussion relates specifically to the Table. The same general methodology applies to developing Modules. They can be easier to develop because the basic METT-T have been already defined by the parent Table. Module construction can be more difficult, however, when the planning cycle to be represented is longer than normal Table length.

3 Probes were developed by Olmstead for Project Forge (Factors in Organizational Effectiveness) in the late Sixties. "A probe is a problem which is designed to stimulate a particular subsystem of the organization and through which data can be recovered separate from that concerned with other probes. Thus probes can be planned to challenge all the different subsystems and to cover a wide spectrum of problems and activities." Olmstead, *Battle Staff Integration*, p. V-8.

Table. All should be designed with that in mind. In other words, a Table is not just an exciting vignette of battle. It is that; but more important, it is a carefully crafted set of cues to cause training in Staff Task Proficiency and Battle Staff Effectiveness to occur. The training development challenge is to assemble the proper cues in logical sequence to ensure that the desired training takes place.

Recall that a wide range of cues will be required--as many as there are MOP and MOE associated with vertical and horizontal BCST. Staff Task Proficiency includes both individual staff member tactical and technical competence and small staff team tactical and technical competence. The range of requirements is reflected in Enclosure 1, App. 2.5. In addition, Battle Staff Effectiveness--particularly the organizational processes of Organizational Competence (sensing, communicating information, decision making, stabilizing, communicating information, coping actions and feedback)--will need cues or probes.

Fortunately, the trainer's "toolbox" is full. We have defined our warfighting doctrine both horizontally and vertically by BOS. And we have an accepted structure for describing battle interactions--METT-T. Each factor can be varied to "mold" the cues which in turn stimulate action or inaction to the prescribed MOP and MOE. The Mission can be varied as defined in the ARTEP-MTP, Defense, Movement to Contact, etc. Enemy can be tailored for the precise desired training effect. Size, equipment, level of training (hit probabilities) and tactical doctrine can be modified readily. Troops can be adjusted to reflect new or old TOE and various combinations of Task Organization and combat effectiveness as the Table commences. Terrain is infinitely variable. As the technology of terrain representation in digital terrain advances, increasingly higher resolution terrain and weather will be available. For now, for training development purposes, one "high resolution" 50 × 50-km "sand box" may be sufficient. Given sufficient variation in natural and man-made features included in the "sandbox," shifting the azimuth of tactical action should provide sufficient flexibility to the training developer, i.e., vary the axis of attack from North-South to West-East. Time Available can have significant impact on staff processes. A relatively simple attack can become extraordinarily challenging when staff planning time is halved--or comes as a frag order change of mission. But there is clearly great flexibility provided to the training developer constructing the Tables.

There are, however, subtle problems which need to be considered. Probably the most vexing are the varying tempos of the planning cycle at different echelons. In Chapter 2 we discussed the challenge of converging Fire Support planning cycles--field

artillery and USAF close air support--for the AAR. Challenging but doable by compressing the air support planning cycle when the training focus is horizontal, Battalion, or Brigade, this can become difficult when the training is vertical. The Corps planning cycle clock runs in days, not hours or minutes.

There can be comparable problems at Battalion. It would appear that a 30- or 60-minute Table (vignette of a "day of battle") would be sufficient to generate Battalion or Brigade Battle Staff Effectiveness cues and most small team Staff Task Proficiency cues. Some individual staff positions such as the S4 may require at least a 24-hour period in order to generate the necessary cues.

Another range of challenges results from the embryonic nature of TES (virtual simulation). Weather, light conditions, terrain modification (craters, etc.) are all poorly represented in the current state of development. Therefore there are nonparallel capabilities to represent the various BOS in warfighting. Maneuver and Fire Support far exceed Mobility, Countermobility, and Survivability in representability. Not a show stopper because workarounds can be fashioned but often at considerable degradation in the cues for that BOS. The Table training developer needs to be acutely aware of the current limitations of the technology as he or she designs the Tables.

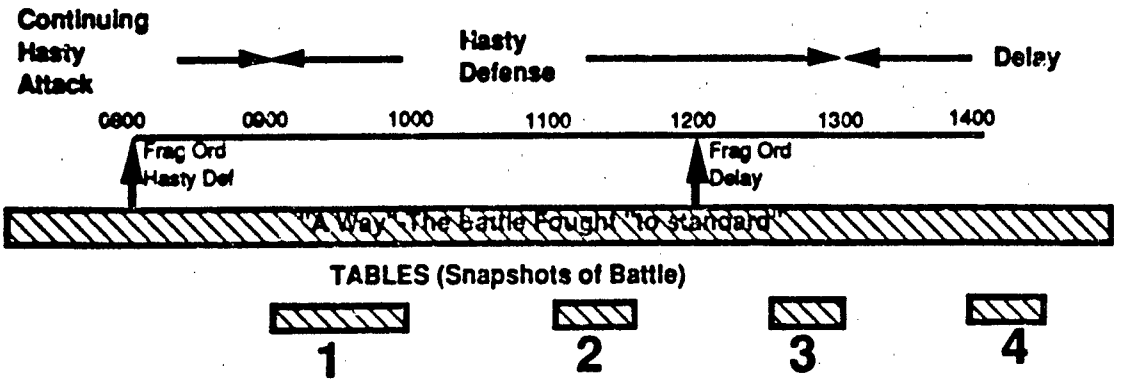
Now, what are some of the Table alternatives? To stimulate thought, thirteen potential Tables are described. They are selected to vary mission, tempo, complexity, etc., of the potential Tables. Recall that the basic purpose here is not solely to cause the staff in training to experience "a battle." Rather it is to cause the necessary cues to behavior which are prescribed by the desired MOP/MOE being trained. The range of training opportunities should be evident in Figure 3.1.1.

Tables 1 to 4 in Figure 3.1.1 place the unit staff in a situation of multiple overlapping unit missions (see Figure 3.1.1). This requires simultaneous Planning, Monitoring, and Directing, as is postulated in emerging doctrine of staff actions. The "day of battle" depicted is grim. There is a steady increase in enemy to the point that the unit has to transition from hasty attack under way as the day starts to hasty defense then to delay. From this difficult day, four vignettes or Tables are selected. Table 1 starts just as the unit receives a Frag Order (0900) to execute a hasty defense at 1030. To ease the difficulty a bit, the commander's initial guidance is provided to the staff. The Table is the next 60 minutes real time of the day of battle, i.e., 0900-1000. The staff has to monitor the continuing execution of the hasty attack while at the same time planning for the hasty defense.

DEVELOPMENT OF BCST TABLES

SCENARIO 1: Multiple, overlapping unit missions which require simultaneous Planning, Monitoring, and Directing

THE "FLOW" OF BATTLE-Steadily Increasing Enemy



Plan and Monitor

TABLE 1 Hasty Attack under way, increasing resistance. FRAGO change of mission to Hasty Defense effective at 1030 received at 0900. Commander's initial guidance provided. **BCST Requirement:** Planning for Hasty Defense while Monitoring continuing Hasty Attack. Table Duration: 60 minutes real time commencing 0900.

Plan

TABLE 2 Improving the Defense. **BCST Requirement:** Planning Defense. Table Duration: 30 minutes real time commencing 1100.

Direct and Plan

TABLE 3 Hasty Defense under way, enemy attack succeeding. FRAGO at 1200 change of mission to Delay on order. Commander's initial guidance provided. **BCST Requirement:** Planning for Delay while Executing Hasty Defense. Table Duration: 30 minutes real time commencing 1230.

Monitor, Plan and Direct

TABLE 4 FRAGO at 1300. Execute Delay effective 1400. **BCST Requirement:** Monitor Defense, Direct Transition from Defense to Delay, Plan Delay. Table Duration: 30 minutes real time commencing 1400.

NOTE: Monitor, Plan, Direct model per ARI Leavenworth (Draft FM 101-5) used FCX-Fire Support Table could be developed from Table 3, an Intel Table from Table 2 above.

Figure 3.1-1. Development of BCST Tables

Table 2 jumps ahead to 1100. The unit is in hasty defense; command and staff are focused on improving the defense. The Table is real time from 1100 to 1130.

Table 3 reflects steady deterioration in the situation. It is now 1230. The enemy attack is succeeding. (Dependent on the training objectives, the battalion could be receiving the enemy main or supporting attack; the difficulty of the Table is increased if the battalion is receiving the main attack.) In any event, the Brigade issued a Frag Order at 1200 directing a delay on order. The Table is real time from 1230 to 1300. As in Table 1, the commander's guidance is provided.

Table 4 is the last Table from this one day of battle. It is now 1400. At 1300, Brigade directed execution of the delay effective 1400. Now the battalion must continue to monitor execution of the defense while directing transition to the delay as planning for the delay continues.

This is clearly demanding BCST--the pacing of Airland Battle on a highly mobile battlefield. As multiple, simultaneous missions develop, these Tables 1 to 4 are at least "CTC class" difficulty. The Tables were selected at specific times to emphasize different training opportunities. If it were desired to make the Tables more difficult, the commander's initial guidance could be omitted or the intensity of enemy action increased or the time shortened between order and execution. Alternatively, times could be stretched out, enemy reduced, etc., to ease the challenge, while still emphasizing the need to be able to handle multiple simultaneous missions.

The technology of TES (virtual simulation) permits great flexibility to the training developer. The simulation knows the location and activity of every object on the battlefield (x, y, z, t). It can restart repetitively with every object precisely repositioned; it can Rewind; and it can Fast Forward. Given this capability, there are two complementary alternatives available to the training developer. First, he or she can design the overall day of battle. That is, they can determine the precise METT-T for the highly trained unit as it fights "a way." The unit is "on its own" once the battle begins but the training developer can interject precise and replicable changes in mission, enemy activity, and friendly support as the battle progresses. When the day is over, the developer has the complete record of virtually all activity by individual staff officer, and small staff team in both battle tasks and

organizational processes.[4] To improve the data, the same day could be fought several times by the "a way" unit--similar to multiple "takes" in producing a training film. In any event, after some number of repetitions, the training developer would have an extensive "virtual simulation library" of a day of battle.

Now, the second aspect of flexibility to the developer. In the Table 1 to 4 example above, the day of battle started sometime before 0800 and continued until at least 1430. Four snapshots or vignettes were selected: Table 1 0900-1000, Table 2 1100-1130, Table 3 1230-1300, and Table 4 1400-1430. One lasted 60 minutes, the others 30 minutes. Optimum frequency and duration must be determined by TEA, but the methodology permits as many or as few Tables as may be desired to be captured from this one "day of battle."[5] Selection here would seem to be a Proponent responsibility.

Now, what if the unit preparing for a CTC rotation wants to train in the Plan, Prepare, Execute model of CTC training? In Figure 3.1-2, Tables 5 to 7 are designed to train this. They focus on the conduct of a Battalion TF deliberate defense. Acknowledging the time required for defensive preparations, the "day of battle" is actually two days long from 0600 day 1 to 0600 day 3. Table 5 stresses staff planning for the deliberate defense. The Brigade defense order was received at 0600, the Table runs real time from 0800 until 1000 with the commander's initial guidance provided. NOTE: This is done to focus on staff, not commander, actions. This sequence could be varied. The Table is unusually long to permit detailed training/evaluation of Staff Task Proficiency and Battle Staff Effectiveness before the battle tempo picks up.

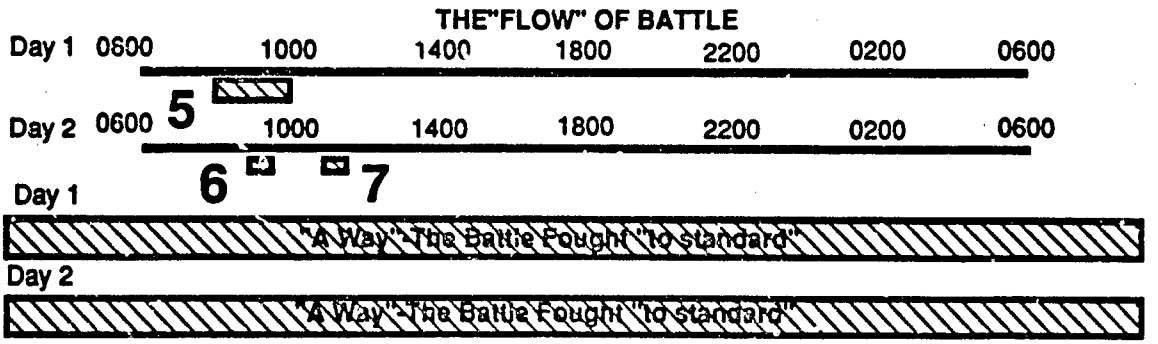
Table 6 shifts the emphasis to Preparation, particularly the conduct of rehearsals. Therefore the snapshot moves forward to day 2 for 30 minutes real time--0900-0930.

The third deliberate defense Table, Number 7, involves the execution of the defense. Assuming battle handoff occurred at 1000, the Table is real time from 1030 to 1100. NOTE: This Table approximates that proposed earlier for the Proof of Principle.

4 This is an enormous data collection effort discussed *inter alia* in Chapter 2. Considerable development will be required to enable this for "a way" and for "your way"--perhaps the most difficult because it must be done in minutes (15), not the hours available to the training developer in the institution. For now assume this collection is doable.

5 There is great potential training support in this one day of battle captured in virtual simulation to support not only unit collective BCST but also individual and small team training in both unit and institution.

SCENARIO 3: **Conduct of a Battalion Task Force Deliberate Defense through Planning, Preparation, and Execution**



TABLES (Snapshots of Battle)

Planning: Analysis, Integration and Order

TABLE 5 Day 1 Brigade Defense Order received at 0600, Bn Cmdr's Initial Guidance at 0800.**BCST Requirement:** Command and Staff Planning for Bn Deliberate Defense. Table Duration: 120 minutes real time commencing 0800. **Training/Evaluation:** Staf f Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Standards recorded in the "A Way" to identical METT-T.

Preparation: Readiness and Supervision

TABLE 6 Day 2 Improving the Defense. **BCST Requirement:** Conduct of Preparation Tasks including Rehearsals. Table Duration: 30 minutes real time commencing 0900. **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Standards recorded in the "A Way" to identical METT-T.

Execution: Movement, Maneuver and Objective

TABLE 7 Day 2 Deliberate Defense. **BCST Requirement:** Conduct of Deliberate Defense. Table Duration: 30 minutes real time commencing 1030. (Battle Handoff 1000). **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Standards recorded in the "A Way" to identical METT-T.

Figure 3.1-2. Development of BCST Tables

The flexibility offered by TES (virtual simulation) is more pronounced in these Tables than it was in Tables 1-4. Despite the current limitations in portraying limited visibility in virtual simulation, there are at least twenty or so hours of command and staff activity available for selection as Tables. Once "a way" execution has been documented, the training developer has great flexibility. The issue again is which cues are required in order to generate the MOP and MOE desired to be trained by the Proponent?

The next set of Tables in Figure 3.1-3 is designed to fall between the complexity of the first two sets above. This scenario involves a smooth flow from movement to contact to hasty attack as sequential missions but the flow is designed such that the unit must Monitor, Plan and Direct simultaneously. Now the "day of battle" is only about 6 hours in length. In Table 8, the battalion is executing movement to contact as the train battalion in a brigade column. The lead battalion makes contact and at 1000, battalion receives a Frag Order from brigade to conduct a hasty attack. The Table starts at 1030 and runs real time for 60 minutes. Commander's guidance is provided. The staff requirement is to plan the hasty attack while monitoring the continuing movement to contact.

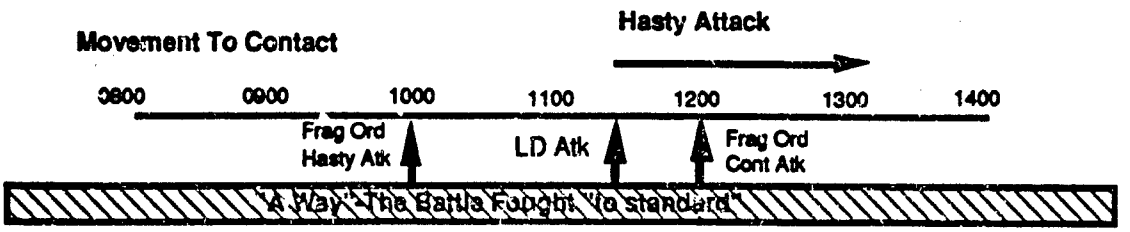
Table 9 is the execution of the battalion hasty attack. LD time is 1100, the Table runs real time from 1100 to 1130. Table 10 is much more complex. The enemy situation changes, battalion receives a Frag Order from brigade to continue the hasty attack but to a different, more distant, objective. Now the battalion must continue to execute while doing the planning for the change of mission attack. The Frag Order is received at 1200, the Table runs real time from 1200 to 1230. Now the commander and staff together are involved in the compressed planning process,

Table 11 is the same as Table 8 but now the commander's planning guidance is not provided. The Table starts with receipt of the Frag Order from brigade and runs real time for 30 minutes from 1000 to 1030. The unit is placed in a simultaneous Monitor (movement to contact), Plan (hasty attack) and Execute (hasty attack) situation.

The range of training possibilities permitted by these Tables should be evident. As Time Available is varied, planning is compressed to the point that staff drills, in fact unit action drills, become essential. Other METT-T factors can be varied with equivalent effects dependent on the training objectives of the proponent who constructs the Tables. Remember, however, that the purpose of the Tables is not the explicit warfighting action, challenging as it may be. The purpose is to develop the cues required to develop the MOP and MOE associated with Staff Task Proficiency and Battle Staff Effectiveness. **Creating proper cues is the purpose of the Table.**

SCENARIO 4: Sequential unit missions which require simultaneous Planning, Monitoring, and Directing

THE"FLOW" OF BATTLE-Fluid Offensive Operations



TABLES (Snapshots of Battle)

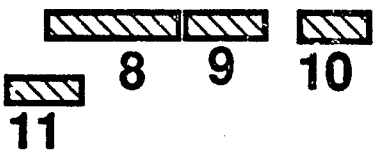


TABLE 8 — **Plan and Monitor**

Executing Bde Mvmt to Contact (Trail Bn) FRAGO Hasty Attack. Cmdr Initial Guidance provided. **BCST Requirement:** Planning for Hasty Attack while Monitoring Movement to Contact. Table Duration: 60 minutes real time commencing 1030. **Training/Evaluation:** Unit performance in designated Measures of Performance in Table Snapshot compared to same MOP recorded in the "A Way" to identical METT-T.

TABLE 9 — **Direct**

Conduct Hasty Attack. **BCST Requirement:** Executing Attack. Table Duration: 30 minutes real time commencing 1100. **Training/Evaluation:** Same as Table 8.

TABLE 10 — **Direct and Plan**

Hasty Attack under way, not on Obj. FRAGO at 1200: Continue Attack, change of Objective. **BCST Requirement:** Planning for new Obj while Executing Hasty Attack. Table Duration: 30 minutes real time commencing 1200. **Training/Evaluation:** Same as Table 8.

TABLE 11 — **Monitor, Plan and Direct**

Same as Table 8; however, BCST starts without Commander's Guidance. **BCST Requirement:** Planning for Hasty Attack while Monitoring Movement to Contact. Table Duration: 30 minutes real time commencing 1000. **Training/Evaluation:** Same as Table 8.

Figure 3.1-3. Development of BCST Tables

Thus far, discussion of Tables has been directed at the different models of staff planning which can be be trained in BCST. There is even greater flexibility if Tables are designed to stress different conditions. In Appendix 1.1, we presented the original concept paper for BCST, Enclosure B, Battle Command/Staff Tables. That introduces the concepts of Basic Coordination Exercises, Staff Actions Exercises, and Command/Staff Reaction Exercises. Essentially, the Basic Tables train and evaluate basic staff procedures against a minimum enemy. The Staff Actions Tables are more complex. The enemy is more competent and joint collateral operations are required. The third and most challenging Tables are Command/Staff Reaction Tables with degraded friendly opposing a highly capable enemy in joint operations, often with allies. See Enclosure 1, App. 3.1, for a graphical representation of these three sets of Tables. Now apply that hierarchy to the Tables suggested above.

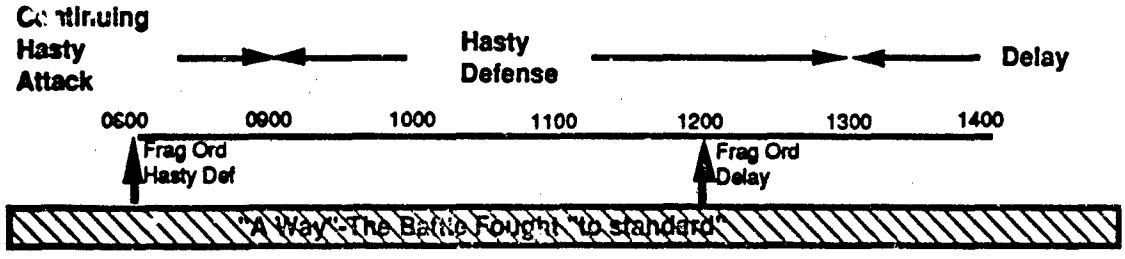
Table 1 returns in Figure 3.1-4 exactly as we represented it above. Now, however, two new Tables are added--1A and 1B. In Table 1A METT-T has been modified to make the Table more difficult. There is much more enemy and less time for staff planning prior to execution of the Hasty Defense. Execution of the defense would require orchestration of Brigade collateral operations such as JAAT into an Engagement Area. Table 1B, the Reaction Table, portrays an even more difficult mission. Still more enemy, all unanticipated, substantial friendly losses inflicted before the Table is initiated and less planning time for the unit. Once the "a way" unit is engaged in fighting the Basic Tables, it would seem both desirable and feasible to create Staff Action and Reaction Tables as "what if" training opportunities.[6]

Thus far, the duration of the Tables has been considered solely from the training sense in the context of the warfighting represented in the Table itself. That is, about how much time is required for cues to develop to desired MOP and MOE? There is another equally important factor for the Guard. The Tables need to be structured such that they can be trained in the average unit in Unit Training Assemblies (UTA) of four hours duration. At Enclosure are several variations in how the Tables could be shaped to support a MUTA 2 or MUTA 3. A number of training approaches are possible. They need to be evaluated in TEA. Suffice to say, the majority of the training time should be consumed in

[6] There would appear to be valuable opportunities to create the Staff Action and Reaction Tables to sharpen BCST for highly ready AC contingency units.

SCENARIO 2: **Multiple, overlapping unit missions which require simultaneous Planning, Monitoring, and Directing. METT-T varied to increase the difficulty of the BCST challenge.**

THE"FLOW" OF BATTLE-Increasing Enemy



TABLES (Snapshots of Battle)



TABLE 1
(Basic Coordination)

Hasty Attack under way, increasing resistance. FRAGO change of mission to Hasty Defense effective at 1030 received at 0900. Commander's initial guidance provided. **BCST Requirement:** Planning for Hasty Defense while Monitoring continuing Hasty Attack. Table Duration: 60 minutes real time commencing 0900. **Training/Evaluation:** Unit performance in designated Measures of Performance in Table Snapshot compared to same MOP recorded in the "A Way" to identical METT-T (from CTC?).

TABLE 1A
(Staff Action)

Hasty Attack under way, significant increase in unanticipated resistance. FRAGO change of mission to Hasty Defense effective at 1000 received at 0900. **BCST Requirement:** Planning for Hasty Defense while Monitoring continuing unsuccessful Hasty Attack. Table duration 60 minutes real time commencing 0900. **Training/Evaluation:** Unit performance in designated Measures of Performance collected by Datalogger and Manual Data Collection.

TABLE 1B
(Reaction)

Hasty Attack under way, significant increase in unanticipated resistance, heavy friendly losses. FRAGO change of mission to Hasty Defense effective at 0930 received at 0900. **BCST Requirement:** Planning and Directing Hasty Defense while Monitoring (Extricating) Hasty Attack. Table Duration 30 minutes real time commencing 0900. **Training/Evaluation:** As above 1A.

Figure 3.1-4. Development of BCST Tables

the primary training experience, the AAR, not in the execution of the Table. In addition, the training time should be organized such that the unit has an opportunity to refight the Table after the AAR. And the unit has to be introduced to the warfight so it does not flounder when the "war" starts.

There is a wide range of Table combinations possible for IDT training, ranging in duration from 2 to 5 MUTA. The training development challenge is to validate, then recommend, various combinations of Table training packages amenable to Guard time constraints and responsive to chain of command mission requirements; the training level of the unit staff--individually and as small teams--and available training support. The overall package should consist of Table introduction--a context established so that the unit staff in training "your way" rapidly fills the shoes of the "a way" unit at the instant when the real time warfight starts. This is discussed in Appendix 3.3, Setting the Context. Then the Table must be quickly followed by the AAR as the primary training event. The AAR was discussed in Chapter 2. Between setting the context (pre-Table) and the AAR (post-Table) there are opportunities for many types of Table training exercises.[7] See Table Execution: Three Alternatives MUTA 2 or 3, Enclosure 2, App. 3.1.

Recall that the basic purpose of the Table as a part of BCST is to cause the necessary cues to facilitate training in Staff Task Proficiency and Battle Staff Effectiveness. The battalion echelon horizontal Tables 1 to 11 described above are total unit exercises designed to train both Staff Task Proficiency and Battle Staff Effectiveness tasks and organizational processes. To the new battalion staff--new commander, S3, S1 after Annual Training for example--some of the tables would be overwhelmingly full-up even if all have reviewed the "a way" Table in detail before the MUTA. That unit needs command tactical training for the commander (TCDC or equivalent), individual staff officer training for the S3 and S1, probably small team training for the S2, S3, FSO, and S1, S4 teams and then organizational processes training for the entire staff team. "A way" execution of any of the 13 Tables suggested above should be available, cut up into "bite size" Modules addressing these individual, small team, and full staff organizational processes training requirements. These Modules were discussed in Appendix 2.5. See Enclosure 2, App. 2.5. Those modules as well as the full Table training support material should be available for the unit staff in training.

7 By definition, the Table is distinguished from an STX by the "frozen" METT-T at the moment of initialization of the virtual simulation for the Table. When the unit masters the "basics" in the Table, it proceeds to the more free-flowing Situational Training Exercise (STX) prescribed in FM 25-101.

One hundred battalions will have one hundred unique training situations which need to be addressed if the BCST is to be responsive to the various chains of command--not a problem if all decide that Tables X or Y or Z are the proper scenarios and the proponent prepares not only "a way" warfights of the entire Table but also the "bite-size" Modules (mini-exercises?) that focus on individual and small team staff task proficiency and Battle Staff Effectiveness to the METT-T of the unit horizontal Table. Then the unit chain of command can determine precisely what portion of Table X or Y or Z they will train on a given MUTA. Hopefully, there will usually be a full up battalion Table wedged between the pre-Table context and the post-Table AAR discussed above.[8] The unit will have conducted the individual and small team pretraining on a distributed basis before the MUTA.

Thus far, all of the Table training scenarios discussed have been horizontal. What about vertical scenarios which could train the Battlefield Operating Systems vertically? The process appears to be the same at least for Staff Task Proficiency. The vertical task lists prepared by the various proponents have been validated as part of the requirements validation process to support systems acquisition. Individual staff tasks are modified to stress vertical coordination within the BOS. Small team tasks now become vertically rather than horizontally based. The team for fire support is the Company FIST, the Battalion Fire Support Coordinator, and the Brigade Fire Support Coordinator, as well as representatives of other forms of support such as Close Air Support or Naval Gunfire.

Development work does not appear to have been done on organizational processes applied vertically but intuition would say that there should not be major differences from horizontal processes. NOTE: Planning clocks run at separate rates, however, as discussed above. Compression or acceleration capability will need to be built into the TES. This hypothesis needs to be confirmed. For initial development work, the logic that produced horizontal BCST Tables appears transferable to vertical Tables.[9] Further, they can be grouped as Coordination (Basic), Tactical Action (Joint), and Reaction (Allies) Tables. See Enclosure 3, App. 3.1, "Vertical" Tables.

8 It would seem highly desirable to have TSD, State Academies, or RF Schools conduct the individual staff and small team modules for new personnel before the MUTA when the full Table is scheduled. All of the training support material would be based on "a way" execution of the full-up Table so all pretraining would be focused on the METT-T of the Table selected--and would be to common task, condition, and standard. We will return to this issue in Chapter 5.

9 This all needs to be developed further. Intuition may be wrong. For example, as pointed out by Mike Malone, power (to influence processes) varies dramatically as one ascends the chain of command.

The next challenge is to modify the Tables to respond to the cue and MOP/MOE requirements of the various BOS. This has been done for Fire Support. The rationale, tasks, and general methodology seem valid. See Enclosure 4, App. 3.1, Tactical Tables--Fire Support.

The final conceptual check is to convert the general rationale of horizontal Tables to Vertical. This has been done as proposed above with Tables 5 and 7 in Figure 3.1-5 below.

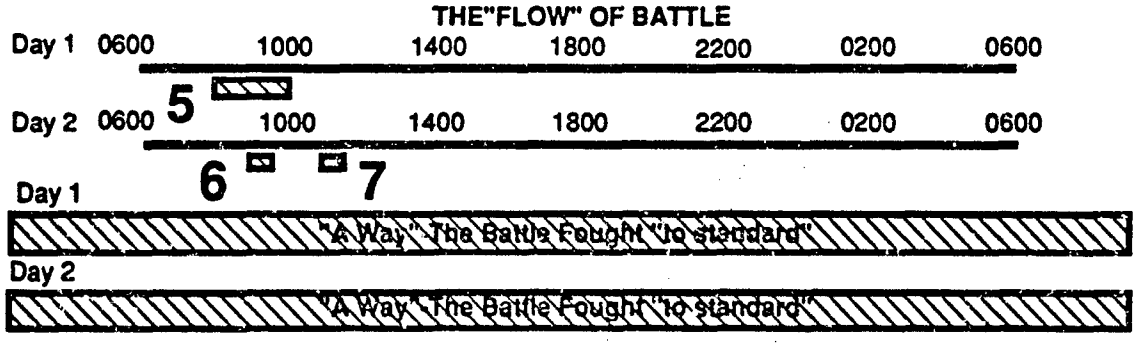
Horizontal Table 5 focused on Planning the deliberate defense. That Table is converted to a vertical Fire Support Table at the coordination level of complexity by adding the detailed fire support planning from the Company FIST up to Division Artillery.

Horizontal Table 7 executed the defense for 30 minutes, starting 30 minutes after Battle Handoff from the Covering Force. The proposed coordination Table vertical Fire Support executes the various fire plans for that Bn TF from Company FIST to Division Artillery FSE.

Conceptually, the logic appears transferable. For additional discussion, see App. 1.2, Vertical BCST--Fire Support General Principles. This should be confirmed by TEA, preferably building on the institutionalized Fire Coordination Exercise. The Table training scenarios proposed appear satisfactory for both horizontal and vertical BCST.

The challenge now is to design and execute a confirming Proof of Principle.

Methodology: **"Fight"a Battalion Task Force Deliberate Defense through Planning, Preparation, and Execution to create "a way" then expand unit-oriented (Bn) horizontal tables (5&7) to vertical tables to train the BOS (Fire Support in example)**



Snapshots of Battle Proposed as Bn and FS Tables

Planning: Analysis, Integration, and Order

TABLE 5

Day 1 Brigade Defense Order received at 0600, Bn Cmdr's Initial Guidance at 0800. **BCST Requirement:** Command and Staff Planning for Bn Deliberate Defense. Table Duration: 120 minutes real time commencing 0800. **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

COORDINATION TABLE FIRE SUPPORT PLANNING

Extend Proposed Table 5 to plan the Fire Support including Mortar, Field Artillery, Copperhead, DPICM, FASCAM and Attack Helicopters. Planning from Co FIST to DIVARTY FSE. **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

Execution: Movement, Maneuver, and Objective

TABLE 7

Day 2 Deliberate Defense. **BCST Requirement:** Conduct of Deliberate Defense. Table Duration: 30 minutes real time commencing 1030. (Battle Handoff 1000) **Training/Evaluation:** Staff Performance in execution of Combined Arms Battle Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

COORDINATION TABLE FIRE SUPPORT EXECUTION

Extend Proposed Table 7 to execute the Fire Support from Co FIST to DIVARTY FSE. **Training/Evaluation:** Fire Support "Battle Team" performance in execution of Fire Support Tasks to Standard in Table Snapshot compared to same Tasks recorded in "A Way" to identical METT-T.

Figure 3.1-5. Creating BCST Tables (Horizontal and Vertical)

Enclosure 1, Appendix 3.1

COMBINED ARMS TACTICAL TABLES

Basic Coordination Tables

- Review coordination of basic Staff Procedures vertical by BOS and horizontal by echelon-Bn/Bde
- Full staff-all BOS supported, no degrade to capability
- Minimum OPFOR (SAFOR)to stimulate cmd/staff action
- Crawl, walk, run to standard-more difficult conditions

BATTLE COMMAND/STAFF TABLES

These tables are designed to develop mission ready battle staffs-Cmd Gp and TOC by requiring demonstrated proficiency to standard in increasingly complex operations. They draw on the SIMNET/CCTT technologies which permit variable resolution in the representation of the BOS. Plan View Display, SAFOR, Stealth Transporter and Data Logger are all integrated to provide timely AAR feedback to Command and Staff in agreed MOE to predetermined METT-T by BOS. Future developments may permit use of constructive simulation such as JANUS or BBS.

Staff Actions Tables

- Train coordination of priority combined arms collateral operations
- Full unit-all BOS manned, no degrade to capability
- Competent, aggressive OPFOR "fighting to win"
- Stress all BOS, embedded AAR

POTENTIAL

- Opportunity to fight your Contingency mission on that terrain focused by echelon or by BOS
- Through seamless simulation and variable granularity, fight with your force actually "on the ground"--many objects(tanks,trucks, emitters,etc.). All must receive timely command/ staff direction, just as in battle.
- Semiautomated Forces (SAFOR) permit major units to be fought with minimum personnel. Key battle decisions at subordinate echelons are human. Distributed simulation is supportive of distributed RC units or coalition allies.
- Technology developments should permit hybrid simulation where a CFX could be conducted with some fighting from actual vehicles while others fight from simulators and others are in a CPX or classroom environment
- Tables can be disaggregated into Modules addressing specific individual staff officer or small staff team tasks

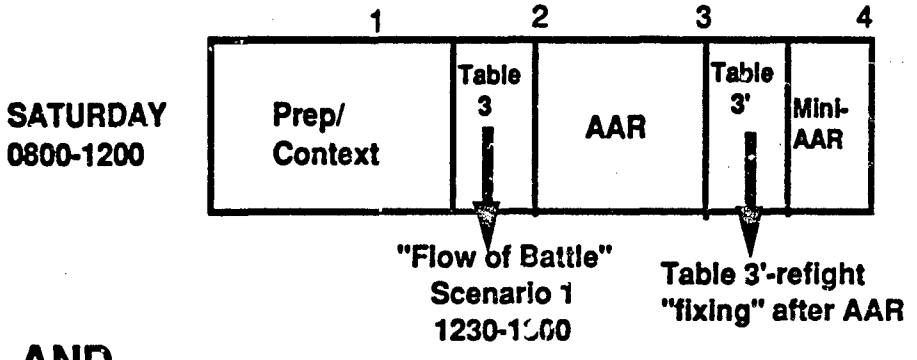
Command/Staff Reaction Tables

- Intense,demanding tactical situations requiring quick, innovative responses
- Degraded mode by BOS-key personnel casualties, logistic shortages,
- OPFOR (SAFOR) advantage, challenging missions.
- Stress joint and combined coordination under challenging conditions

TABLE EXECUTION: THREE ALTERNATIVES
MUTA 2 or 3

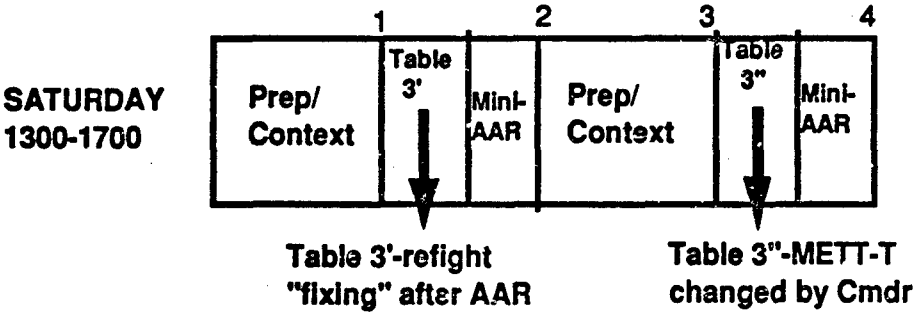
Flexible to various training requirements, such as:

"FIX" and REFIGHT



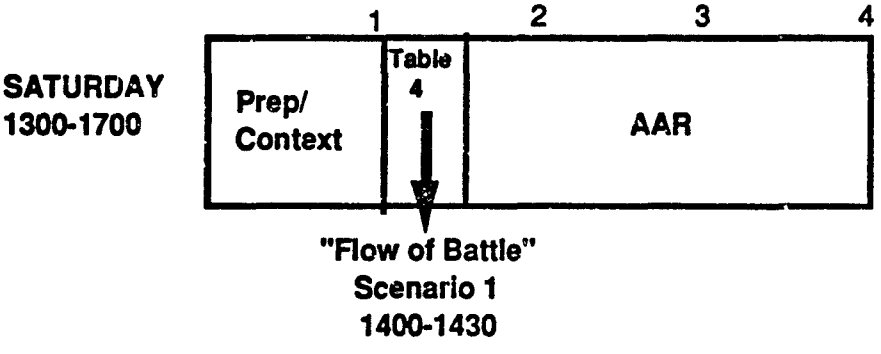
AND

CHANGE METT-T "WHAT IF"



OR

COMPLEX TASKS-Long AAR



Enclosure 3, Appendix 3.1

"VERTICAL" TABLES

Coordination Tables — Fire Spt, Intel, CSS etc. — ARMY
- Review common understanding of basic vertical BOS responsibilities - smallest BOS unit to EAC
- Full BOS-all eqpt manned, no degrade to capability
- Minimum OPFOR sufficient to stimulate BOS action
- Sequenced stressing of BOS at each echelon

Tactical Actions Tables (BOS) — JOINT
- Train priority collateral operations - JTF orientation
- Full BOS-all eqpt manned, no degrade to capability
- Competent, aggressive OPFOR "fighting to win"
- Simultaneous stressing of BOS at each echelon

Reaction Tables (BOS) — ALLIES
- Intense, demanding tactical situations requiring timely BOS employment in multi-BOS collateral operations
- Degraded mode-key personnel casualties, logistic shortages, OPFOR advantage in BOS
- Stress both joint and combined operations with regional allies

PROPOSED

COMBINED ARMS TACTICAL TABLES (HEAVY)

STEP 1: ADD Co & Bn (Horizontal)

Tank Heavy Company Team
J Coordination Within Company Team
K Company Team Tactical Actions
L Company Team Reaction Exercises

Battalion Task Force (2 Tank, 2 Mech)
M Coordination Within Bn TF
N Battalion TF Tactical Actions
O Battalion TF Reaction Exercises

UNDERWAY

STEP 2: ADD BOS (Vertical)

Coordination Tables (BY BOS) — ARMY
Tactical Actions Tables (By BOS) — JOINT
Reaction Tables (BY BOS) — ALLIES

Note: Tables are prepared for each of the seven BOS at each of the three levels of complexity

EXISTING

TANK COMBAT TABLES:

Gunnery and Tactical

Gunnery Tables 1-12
Tactical Tables A-I

Individual Tank
A Individual Crew Member tasks
B Crew Drills
C Crew Reaction Exercises

Tank Section
D Coordination Between Crews
E Section Drills
F Section Reaction Exercises

Tank Platoon
G Coordination Within Platoon
H Platoon Drills
I Platoon Reaction Exercises

Tactical Tables - Fire Support

Coordination Tables

Coordination Tasks: Fire Support

- Plan Fire Support of a Bn TF deliberate defense (Proposed Bn Table 5) Fire Support available includes Mortar and Field Artillery HE.
- As above, Fire Support expanded to include CLGP (Copperhead), DPICM, FASCAM and Attack Helicopters. Plan counter-preparation ; Arty Bde GSR.
- Execute FS Plan above(Proposed Bn Table 7) shift FS priorities at Bde or Div during defense

- Tables executed "crawl,walk,run" to increasingly complex tasks and challenging conditions.
- BOS "team" provided normal command/staff support unless indicated otherwise.
- "Automated"collation of AAR info for desired MOE for each BOS at each echelon. Other BOS Manned, SAFOR or IFOR per training required.
- O/C or OE requirements flexible to command modifications required by unit distribution.
- Predetermined METT-T to ensure specific MOE/MOP for training/evaluation in the AAR.

ILLUSTRATIVE EXAMPLES OF TASKS ACTUAL TABLES CONSTRUCTED BY PROPONENT FROM ARTEP-MTP DRAWING ON HORIZONTAL TABLES AS APPROPRIATE

Tactical ActionsTables

Tactical Actions Tasks: Fire Support

- Direct and Plan Fire Support for Bn TF Hasty Defense then Delay. (Proposed Bn Table 3) Fire Support includes Div counterfire employing Field Artillery (MLRS) and NGF, immediate JAAT of Regimental size EA and JSEAD for immediate CAS
- Plan, Monitor and Direct Fire Support Bn TF Hasty Attack then Hasty Defense (Proposed Bn Table 1A). Hasty Attack includes a preparation,neutralization and obscuration fires.
- As above, integrate nonlethal - EW

Reaction Tables

Reaction Tasks: Fire Support

- Plan, Monitor and Direct Fire Support Bde TF Hasty Attack then Hasty Defense (Proposed Bn Table 1B extended to Bde) on Division boundary with regional ally. Maneuver Bde directed to "support" ally.
- Situation above, now Plan, Prepare and Execute Fire Support of the Ally by an Arty Bde with priority for CAS, JAAT and NGF.
- Execute proposed Bn Table 3 at reduced CSR, at 70% strength of personnel and equipment and with OPFOR at 2 to 1 superiority in Fire Support units.

- Tables include Fire Support Planning and Fire Support Execution tasks as defined in USFAS "Red Book". Tasks are focused at Bn, Bde and Div echelons
- In each of these situations, multiechelon Fire Support command and staff personnel are assembled from Company FIST to Corps Artillery to ensure that vertical "teaming" within the Fire Support BOS of the contingency force package occurs.

APPENDIX 3.2

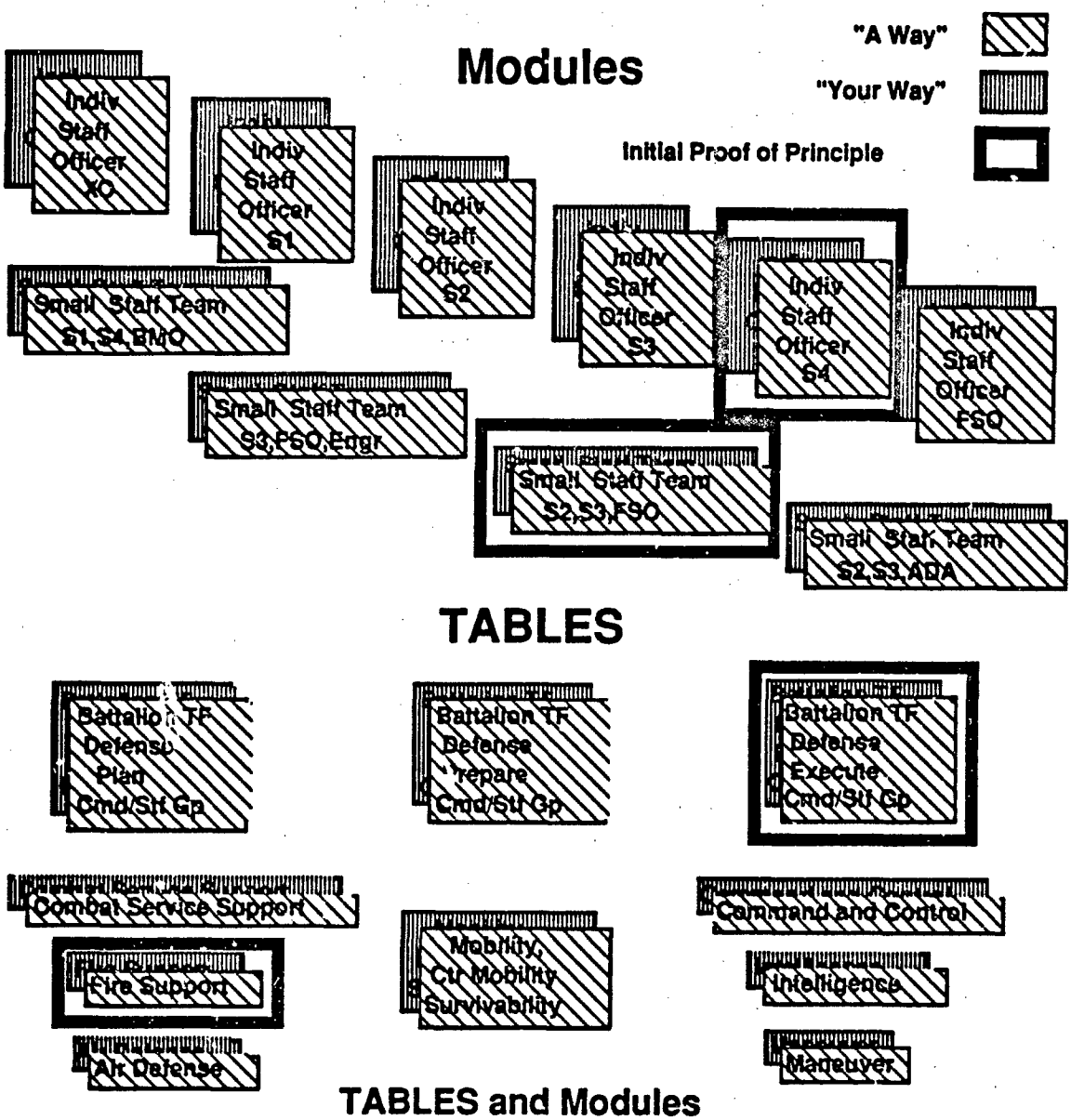
TABLES FOR THE PROOF OF PRINCIPLE

APPENDIX 3.2
TABLES FOR THE PROOF OF PRINCIPLE

In Appendix 3.1, a range of Tables and Modules was suggested, supportive of Staff Task Proficiency and Battle Staff Effectiveness. As was pointed out, most of the concept seems intuitively correct in that it is based on general extensions of current practice in the Army Training System. Yet there are aspects of immersion, compression of training, and distributed quality control using emergent technologies which are new and untested. Vertical BCST is in itself an evolving concept as Airland Battle doctrine matures and new challenges for the application of land power develop. Therefore, frequent Proofs of Principle will be essential as BCST evolves and matures. The purpose of this Appendix is to suggest the composition and design of the initial POPs.

It seems clear that POPs need to assess the efficiency and effectiveness of both vertical and horizontal Tables designed for the training of full battle staffs and the various Modules (subsets of Tables) developed for more focused training of individuals or small teams (see Figure 3.2-1). First, to select Tables. In Chapter 2, Battalion TF, Defend, Execute drawing on the Combined Arms Tasks developed by ARI Monterey was selected as the horizontal Table. Appendix 1.2, Vertical BCST--Fire Support, proposed that the initial vertical BOS Table be Fire Support. Excellent vertical task analysis has been done by Ft. Sill and there is a Fire Coordination Exercise already in the Army exercise inventory prescribed by FM 101-25. Therefore, for the POP of vertical Tables, expansion of Ft. Knox TC 71-5 is selected. Selection of one horizontal mission and one vertical BOS is indicated in Figure 3.2-1. There are several particular challenges associated with these Table POP. Needless to say there is a myriad of other aspects of the training program which need to be evaluated, but these should be answered quickly. The POP must validate:

- That in each case the Table does in fact cue the MOP and MOE required by the training developer. The "A Way" Table prepared by the Proponent is central to this BCST concept. Is the "A Way" Table sufficient to train both Staff Task Proficiency and Battle Staff Effectiveness as defined in Chapter 2?
- Does the training support distributed with the "A Way" Table lead the unit in training to successful unit performance during their execution of the Table--the "Your Way" Table?



Modules are portions of Tables extracted for purposes of individualized Staff Task Proficiency and Battle Staff Effectiveness Training pre- or post- full-up Table training in unit missions.

Figure 3.2-1. Proofs of Principle - BCST

- Does the proposed training program develop the expected effectiveness and efficiency of time compression and immersion in TES (virtual or constructive simulation) in the distributed Guard units?

The second major POP area is evaluation of the Modules. As is apparent in Figure 1, there are a number of modules mandated by the requirement to develop Staff Task Proficiency. The most obvious are indicated. Practice will develop others, particularly as vertical Tables are developed and new vertical small staff teams appear.[1] As discussed in Chapter 2, the S4 and the S2, S3, FSO small staff teams seem to provide the best prototypes for early development for POP purposes. There are several essential questions which need to be answered here too.

- Does the resolution (detail of data collection) of the base horizontal and vertical Table permit ready constitution of the Modules--for both Staff Task Proficiency and Battle Staff Effectiveness Training?
- Do the "A Way" modules train to the necessary MOE and MOP established by the base Table scenario?
- Can successful execution of several modules (Defense, Attack) provide sufficient individual and small staff team basic task proficiency?

In other words, the content of the Modules is entirely dependent on the content of the base horizontal or vertical Table. How many of these mission-oriented Modules are necessary to train to basic acceptable proficiency levels? Hopefully, six Modules (or combinations thereof) will suffice for horizontal training: Defend-Plan, Prepare, Execute and Attack--Plan, Prepare, Execute. These Modules would then be "cut and pasted" into MUTA training packages for Guard use. Vertical training at least at Battalion and Brigade echelons should be supported from the same six Tables.[2]

That is what needs to be done. Now, to prioritize the various POP as has been proposed above. The first Table should be Bn TF Defend Execution. That addresses the primary training need of the Guard. If Bn horizontal BCST is not "doable" to standard at

1 If the number of modules, and work effort, appear prohibitive, recall that the methodology described is equally valid as the core of professional training in warfighting for institutional training both resident and distributed non-resident--all tied by reference to standard unit Tables. Training support for Tables may be usable for advanced-technology individual and collective training in institution and unit across the Total Force. This potential is discussed further in Chapter 6.

2 This congruence appears highly unlikely for vertical training at Division and Corps echelons. Challenges and opportunities for each BOS are far broader at these higher echelons. Battle Command Training Program (BCTP) executed in constructive simulation may provide the necessary training support at those echelons. The MOP and MOE could then be translated to virtual simulation for application at Battalion and Brigade, Regiment, Group echelons.

satisfactory resource cost, it is doubtful that the ancillary products will be either. The next priority should be to the Module S2, S3, FSO small staff team because their coordination responsibilities go to the heart of synchronization in Airland Battle. Improved training there could contribute immediately to improved force effectiveness. In addition, that staff team is central to execution of Fire Support, the vertical BOS selected for POP. Hopefully, there will be overlap, which will reduce costs.

Fire Support appears to be the best documented BOS. Therefore the Table should be relatively simple to construct--drawing on the Fire Coordination Exercise--and Lessons Learned could be available for timely application to other BOS. That leaves the S4 module for last. Hopefully, experience in the three preceding POP will provide insights how to best handle an area (logistics) where the cycle of action is different. A full "day of battle" may be required to generate combat service support MOP/MOE recoverable in 30 to 60 minutes of the maneuver-fire support fight. So the proposed priority for development of the four initial products is:

1. Table: Battalion TF, Defend, Execute.
2. Module: S2, S3, FSO small staff team tactical/technical competence.
3. Table: Fire Support: Co/Bn/Bde echelons
4. Module: S4 individual tactical/technical competence

Next, a general plan needs to be laid out to develop each of the Tables and Modules. The following is suggested as several thoughts on "how to" (NOTE: Appropriate DARPA, NGB, TRADOC, FORSCOM, ARI coordination assumed):[3]

1. DEVELOP THE TABLE BATTALION TF, DEFEND, EXECUTE

a. Initial general MOP/MOE are suggested in App. 2.3. Review, collate to develop a general checklist of what cues must be present in the objective Table. For now, do not get into individual staff position MOP and MOE. Focus is overall unit performance.

b. The NTC data base currently maintained at ARI Monterey (Combat Operations Research Facility) has sufficient detail to provide a "first cut" at METT-T and unit designation of a Bn TF that has accomplished BN TF, Deliberate Defense,

[3] Fort Knox is now doing excellent work with FORSCOM and the NTC to capture "real time" tactical unit "a way" execution of attack and defend mission execution at the NTC. This is extremely useful. It may not, however, provide sufficient cues across BCST tasks to be trained for use in a BCST Proof of Principle without considerable augmentation. The methodology described here is appropriate if the Table/Module has to be built "from scratch."

Execution at the NTC well hopefully within the past year. Cross checking against the MOP/MOE checklist developed above, select a specific operation and associated unit which can be used as the tentative actual model of "a way" execution for development purposes. Analyze mission execution by that actual unit for METT-T usable in the Table to be developed. Select the METT-T for the objective Table. Draw on the expertise and counsel of the chain of command of the "a way" actual unit throughout the remainder of the development. They should be a "red team."

c. Analyze the METT-T for the objective Table from the perspective of feasibility of execution on the NTC data base at the Combined Arms Tactical Training Center at Ft. Knox. What can be represented, what cannot be? If it cannot be, is there a manual or prototype technology "work around"? When, at what cost? Returning to the MOP and MOE in a. above, how many of the MOP and MOE can be collected given the current Data Logger, UPAS, etc.? Where are there manual or visual (TV) or audio (net taping) data collection "work-arounds"?

d. Develop a detailed production schedule (time, resources required) to execute the "a way" mission. Think of this as producing a Training Film with total documentation--all orders written and oral, all tactical nets recorded, all staff officers' activities recorded, all AARs recorded. Exhaustive documentation!

e. Produce "a way" Bn TF Defense Execution in virtual simulation at CATTC using the commander and staff of the actual "a way" unit which is being modeled, or another TOE unit or using personnel at Ft. Knox. First iteration should probably be "free flow"--unit and individual execution as they recall at the NTC. Second iteration should be with proponent direction to "fill in the gaps" of MOP and MOE which were not done or not captured in the first iteration. At this stage, SME from USAARMS Command and Staff should probably review "a way" from the perspective of instructing Bn/Bde staff in OAC. What would they want to have included in "a way" if they were to use the product as the primary training support for resident instruction? Capture this documentation on the second iteration. Plan a third iteration for "Murphy."

f. Select one or more Round Out/Round Up Tank or Mechanized Infantry Bns as the developmental "your way" units. Fit the BCST to their unit training situation and FY93/94 training program. Develop their requirements for pre-train and setting the context training support material as well as for Table execution.

g. Repeat the analysis in c. above for SIMNET Ft. Stewart, Camp McCain, and M SIMNET. The requirement for "your way" execution should be much less complex that that at Knox. Knox had to create the "training film" or "a way" in

extraordinary detail to support a number of potential training requirements. "Your way" focuses in on just what is required to meet the BCST requirements of that local chain of command.

h. **Battalion A:** Develop the training support material required for execution of the Table at CATTC. Train the OCs, OEs and other training support personnel. Execute pretrain at the local Armories, "your way" at CATTC. Conduct extensive After Action Reviews of all procedural and substantive aspects of "your way" execution. Apply as appropriate to Battalion B execution, which should occur several months after Battalion A.

Battalion B: Develop the training support material required for execution of the pretrain and Table at distributed Armories using SIMNET-Stewart, McCain, or Mobile SIMNET. Train the OCs, OEs and other training support personnel. Execute pretrain and "your way" at SIMNET-Stewart or McCain or on M SIMNET.

2. DEVELOP THE MODULE: S2, S3, FSO SMALL STAFF TEAM TACTICAL/TECHNICAL COMPETENCE

a. Initial MOP/MOE are suggested in App. 2.3. In coordination with Ft. Knox and Ft. Sill, review, collate to develop a general checklist of what small staff team task cues must be present in the objective Module. Do the same for the organizational processes of Battle Staff Effectiveness to determine what probes may be required.

b. Review the Fire Support BOS data base at the NTC data base currently maintained at ARI Monterey (Combat Operations Research Facility). Analyze fire support mission execution by the Bn TF Defend "a way" actual unit for fire support METT-T, which could be usable in the Module to be developed. Note that detailed MOP and MOE and data backup will be required for fire support at both company and brigade in order to develop a useful picture of synchronization. These data will also be required for the vertical Table: Fire Support. Draw on the expertise and counsel of the FSO, the S2, and the S3 of the "a way" actual unit throughout the remainder of the development. They should be a "red team" for S2, S3, FSO small staff team development. It may be useful to include an actual FIST Chief as well as someone from the FSE at Brigade in the Red Team for "a way" development.

c. Analyze the fire support, S3, and S2 data available--all media--from "a way" execution of the Defend Table prepared above against the MOP/MOE requirements. If there are gaps, develop manual work-arounds.

d. Develop a detailed production schedule (time, resources required) to assemble the Module, drawing on the documentation of the existing Bn TF Defend Table

supplemented by synchronization data available from Company and Brigade. Remember, you are creating in virtual simulation an interactive "training film" of examples of "a way" S2, S3, and FSO synchronization in the Defense.

e. Produce "a way" S2, S3, FSO small staff team training Module in virtual simulation at CATTC.

f. Select one or more Round Out/Round Up Tank or Mechanized Infantry Bns as the developmental "your way" units. Fit the S2, S3, FSO Module to their unit training situation and FY93/94 training program. Develop their requirements for small staff team pretrain and setting the context training support material as well as for Module execution.

g. Repeat the analysis in c. above. Ensure "your way" execution of the Module including work-arounds is "doable" at SIMNET Ft. Stewart, Camp McCain, and M SIMNET.

h. **Battalion A:** Develop the training support material required for execution of the Module at CATTC. Train the OCs, OEs and other training support personnel. Execute pretrain as requested at the local Armories--hopefully using the "a way" material already prepared as training support. Conduct "your way" small staff training, both Staff Task Proficiency, and Battle Staff Effectiveness, at CATTC. Conduct extensive After Action Reviews of all procedural and substantive aspects of "your way" execution of the Module. Apply as appropriate to Battalion B execution, which should occur several months after Battalion A.

Battalion B: Develop the training support material required for execution of the pretrain and Table at distributed Armories using SIMNET-Stewart, McCain, or Mobile SIMNET. Train the OCs, OEs and other training support personnel required. Execute pretrain and "your way" at SIMNET-Stewart or McCain or on M SIMNET.

3. DEVELOP THE TABLE: FIRE SUPPORT: CO/BN/BDE ECHELONS

a. Initial general MOP/MOE are suggested in App. 1.2, Vertical BCST--Fire Support. Review ARTEP/MTP Fire Support Tasks at Company, Battalion, and Brigade, and ASAFAS "Red Book" tasks for AFATADS, collate to develop a general checklist of what cues must be present in the objective Table. Compare with those included in USAARMC FC 71-5; develop a consolidated list. This and all subsequent development should be accomplished in coordination with USAFAS, Ft. Sill.

b. Keying to the actual "a way" Battalion TF selected for Bn TF Table Defend, review Company, Battalion, and Brigade Fire Support data from that actual NTC mission execution. This multimedia, which is currently maintained at

ARI Monterey (Combat Operations Research Facility), should have sufficient detail to provide a "first cut" of METT-T and mission execution for Fire Support during the Defense at Company, Battalion, and Brigade.[4] Cross checking against the MOP/MOE checklist developed above, analyze actual mission execution by that actual unit. Select the METT-T for the objective Table. Draw on the expertise and counsel of the chain of command of the "a way" actual fire support units throughout the remainder of the development. They should be a "red team."

c. Analyze the METT-T for the objective Fire Support Table from the perspective of feasibility of execution at Company, Battalion, and Brigade echelons on the NTC data base at the Combined Arms Tactical Training Center at Ft. Knox. What can be represented, what cannot be? If it cannot be, is there a manual or prototype technology "work-around"? When, at what cost? Returning to the MOP and MOE in a. above, how many of the MOP and MOE can be collected given the current Data Logger, UPAS, etc.? Where are there manual or visual (TV) or audio (net taping) data collection "work-arounds"?

d. Develop a detailed production schedule (time, resources required) to create the "a way" Fire Support of the Bn TF Defend at Company, Battalion, and Brigade/DS Arty Bn. Think of this as producing a Training Film with total documentation--all orders written and oral, all tactical nets recorded, all staff officers' activities recorded, all AARs recorded. Exhaustive documentation!

e. Produce "a way" Fire Support Table of Company, Battalion, and Brigade echelon fire support of Bn TF Defense Execution in virtual simulation at CATTC, using the commander and staff of the actual "a way" fire support chain that is being modeled, or using fire support personnel at Ft. Knox. First iteration should probably be "free flow"--fire support of the unit with fire support execution as they recall actually occurred at the NTC. Second iteration should be with proponent direction to "fill in the gaps" of MOP and MOE which were not done or not captured in the first iteration. At this stage, SME from USAFAS should probably review "a way" from the perspective of instructing Fire Support in OAC. What would they want to have included in "a way" if they were to use the product as the primary training support for resident instruction? Capture this documentation on the second iteration. Plan a third iteration for "Murphy." NOTE: The concept here is to piggyback data

[4] For example "standard" mission graphics maintained on file include Artillery Mission Log, Artillery Prep, Artillery Mission summary sheet, Decision Support Matrix, Execution Matrix, Firing Intensity Profile, and Fire Support Plan. As of 03/92 no specific Fire Support data displays were on file. There appears, however, to be sufficient data to support a POP. This will have to be confirmed after the Bn TF Defend unit is selected. ARI POM Combat Operations Research Facility, "Demonstration of Prototype Capabilities," Chart: Graphics Database, March 1992.

collection for the "a way" Fire Support Table on data collection under way for the "a way" Battalion TF Defend Table realizing that the Fire Support Table is concerned with Company and Brigade and with Plan, Prepare, and Execute, not just the Execute focus of the Battalion horizontal Table. If piggybacking is not feasible, role players may have to be provided to represent the maneuver units.

f. Select one or more Round Out/Round Up Battalions as the developmental "your way" unit. Fit the Vertical Fire Support BCST to their unit training situation and FY93/94 training program. Develop their requirements for pre-train and setting the context training support material as well as for Table execution.

g. Repeat the analysis in c. above for SIMNET Ft. Stewart, Camp McCain and M SIMNET. The requirement for "your way" execution should be much less complex than that at Knox. Knox had to create the "training film" or "a way" in extraordinary detail to support a number of potential training requirements. "Your way" focuses in on just what is required to meet the vertical Fire Support BCST requirements of that local chain of command.

h. **Battalion A:** Develop the training support material required for execution of the Fire Support Table at CATTC. Train the OCs, OEs and other training support personnel. Execute pretrain at the local Armories, "your way" at CATTC. Conduct extensive After Action Reviews of all procedural and substantive aspects of "your way" execution. Apply as appropriate to Battalion B execution, which should occur several months after Battalion A.

Battalion B: Develop the training support material required for execution of the pretrain and Fire Support Table at distributed Armories using SIMNET-Stewart, McCain, or Mobile SIMNET. Train the OCs, OEs, and other training support personnel. Execute pretrain and "your way" at SIMNET-Stewart or McCain or on M SIMNET.

4. DEVELOP MODULE: S4 INDIVIDUAL TACTICAL/TECHNICAL COMPETENCE

a. Initial MOP/MOE are suggested in App. 2.3. In coordination with Ft. Knox and Ft. Lee, review, collate to develop a general checklist of what individual staff officer (S4) task cues must be present in the objective Module. Do the same for the organizational processes of Battle Staff Effectiveness to determine what probes may be required.

b. Review the Combat Service Support BOS data in the NTC data base currently maintained at ARI Monterey (Combat Operations Research Facility). Analyze CSS mission execution by the Bn TF Defend "a way" actual unit for CSS

METT-T, which could be usable in the Module to be developed. Note that detailed MOP and MOE and data backup will be required for CSS at both Combat and Field Trains as well as UMCP and perhaps the Forward Support Battalion in order to develop a useful picture of logistic support. These data should be helpful for subsequent development of CSS vertical BCST Tables whether executed in virtual or constructive simulation. Draw on the expertise and counsel of the S4, the XO, and the BMO of the "a way" actual unit throughout the remainder of the development. They should be a "red team" for S4 individual staff officer development.

c. Analyze the logistics data available--all media--from "a way" execution of the Defend Table prepared above against the MOP/MOE requirements. If there are gaps, develop manual work-arounds for execution at CATTC.

d. Develop a detailed production schedule (time, resources required) to assemble the Module drawing on the documentation of logistic support of the existing Bn TF Defend Table. Remember, you are creating in virtual simulation an interactive "training film" of examples of "a way" S4 staff action in the Defense.

e. Produce "a way" S4 individual staff officer training Module in virtual simulation at CATTC. NOTE: This may be better accomplished in constructive simulation. A TEA will required comparing virtual simulation (SIMNET) and constructive simulation (BBS) in support of this training.

f. Select one or more Round Out/Round Up Tank or Mechanized Infantry Bns as the developmental "your way" units. Fit the S4 Module to their unit training situation and FY93/94 training program. Develop their requirements for S4 pretrain and setting the context training support material as well as for Module execution. NOTE: Intensive training such as this may be neither feasible nor desirable for the Battalion to conduct. More likely Brigade or Division is the best locale. There can be sufficient S4s trained simultaneously to justify the training support cost.

g. Repeat the analysis in c. above. Ensure "your way" execution of the Module including work-arounds is "doable" at SIMNET Ft. Stewart, Camp McCain and M SIMNET for the training of single S4s or, more likely, several in consolidated S4 training.

h. Execution of "your way" to be determined based on degree of centralization of individual staff officer training desired by the Guard.

APPENDIX 3.3

SETTING THE CONTEXT

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SETTING THE CONTEXT

The ability to replicate complex small unit combat situations with absolute accuracy in placing objects in time and space on a visual virtual battlefield for multiple "reruns" creates the training power of advanced simulation for Battle Command Staff Training. The individual (S4), a small team (S3, S2, FSO), and the entire battle staff all can be immersed in an intense battle situation which unfolds before them in real time; in "Fast Forward," to challenging decision points later in the battle; or after "Rewind," to revisit a poor decision or incomplete coordination to do it again. That is the good news for training--the opportunity to "step into " a challenging ongoing "kill or be killed" fight in circumstances carefully crafted to stimulate rapid learning. The bad news is that it is like trying to step from a stationary platform onto a train passing at 50 mph--not just you but you and a team accompanying you. The design of the Tables and derivative Modules themselves presupposes selection of several critical 30- to 60-minute "snapshots" during an ongoing "day of battle." To continue the train analogy, each of these Tables or Modules is a speeding train. Slow the train and you lose much of the training benefit. How to accelerate rapidly--individually, the small staff team and the entire battle staff--so they can enter the train prepared to be effective passengers, in fact, conductors?

So, a significant challenge in implementation of this training concept is placing the individual, small staff team, or battle staff into the situation effectively and efficiently so that each commander and staff officer knows what has preceded the moment when the battle action begins. What was the OPORD and how has it been modified by FRAGO? What was the Commander's intent? What have been the enemy actions? Where are all of the subordinate units? What is their status? What is happening at Brigade and on the flanks? Establishing context requires stage setting for each of the staff members in his or her responsibilities both individually, and as a member of a team synchronizing within the unit staff and across BOS.

There are at least two challenges here--general orientation of all participants and then precise update for the individual or small staff teams to a MOP or MOE level of detail. The general summary should be analogous to the short battle summary used to establish

context for the AAR at the NTC. That is, a brief statement of mission, intended plan, then summary of events BOS by BOS from the start of mission execution, "the day of battle," until the instant of initialization of the Table. The precise update by staff position will be the more difficult of the two--but with the highest potential for additional training applications to amortize the considerable effort. The challenge is to compress into 15 to 20 minutes a thumbnail sketch of the actions and orders of that staff officer or staff team from the start of the planning phase to the instant of initialization of the Table.

In all cases, we are describing "a way" execution--basically drawing on the excellence of the individual staff officers and small staff teams of the "a way" unit to orient their "alter egos" in the "your way" unit as they prepare to "fight" the Table. This should be an extremely productive period of not just orientation (context building) but also positive training. About to "enter the maelstrom," "a way" to do the job is presented as a primer--a "lifesaver" to some. Attention will be high; solid training should occur.[1] NOTE: As a general principle, BCST should be designed for the Guard such that there is virtually no time lost to administration. All actions are productive training. For example, as you learn context for the Table to come, you are being trained in execution of the various tasks to standard by the "a way" unit.

The training development objective is to set the context in 20 to 30 minutes immediately preceding fighting the slice of battle represented by the Table. More time may be required for the first Table of the MUTA when the general METT-T, which will govern all of the Tables of that MUTA, is introduced.[2]

1 Recall that all of this BCST concept involves both "a way" and "your way" execution of tactical operations. "A way" execution of the entire operation is documented in great detail. Thus "a way" actions prior to the instant of initialization are available for setting context, then "a way" execution of the Table is available for review before or after "your way" execution. "A way" AAR is similarly available for review before, during or after the "your way" AAR. All of this detailed "a way" material is available to be "cut and pasted" into individual staff officer and small staff team Modules.

2 This assumes that the IDT training period will consist of several Tables or Modules all grounded in one ongoing "day of battle." Once the staff has entered the virtual battlefield and "fought" on the terrain visually or through the abstraction of the map symbol, there can be quick adjustment to other snapshots as long as METT-T remains substantially unchanged. See Figure 2, Appendix 3.1, Development of BCST Tables Scenario 3: Conduct of a Battalion Task Force Deliberate Defense. After immersion in Table 5, context should be set rapidly for execution of Tables 6 and 7 of Scenario 3 during the same MUTA. And repetitive return to that scenario in subsequent Module training for individuals or small staff teams will increase significantly the productivity of BCST. The "stage" will have been set, the individuals should be able to quickly focus on the staff training objectives. The reverse should apply. After individual or small staff team pretrain in Modules based on Table 5, context will be much easier to establish for execution of Table 5. Everybody has already "been there" in virtual simulation.

The following capabilities should be available to set the context for execution of a Table at Battalion echelon. These are suggestions for data collection from "a way" execution as the Table is being prepared. Once this has been collected, the greater challenge will be to assemble the information into the 15-20 minute training packages necessary to set the context for each staff position and small staff team. NOTE: This is not an exclusive list. It is a start to stimulate imagination as to how to use new technologies to improve significantly commander and staff training.

- The Brigade and Battalion OPORD for "a way" including overlays overprinted on map representations of the digitized terrain data base being used. If the Table is directed at the battalion staff Planning process--per ARI POM--(as opposed to the phases of Preparation or Execution), only the Brigade order and battalion planning up to the point of initialization will be provided. For example, if the focus is on staff coordination in the planning process, the commanders' guidance could be provided gratis as part of setting the context.
- Intelligence Preparation of the Battlefield (IPB) and other annexes to the Brigade Order available to the Battalion Commander and staff as well as oral or written copies of the various Brigade and Battalion nets up to the instant of initialization. NOTE: Whether individual sequential or multiple simultaneous missions, staff planning does not occur in isolation. BOS-oriented coordination and updates flow on the various functional communications nets (Intel, Fire Support, Admin/Logistics). These "flows" should be available to the battalion staff in training up to the moment of initialization. After initialization, content will vary dependent upon the actions of the "your way" staff in training. For AAR purposes, the entire flow on all nets will be available for direct comparison of "a way" with battalion staff actions after initialization "your way."
- Four dimensional (x, y, z, t) representation of the various matrices developed by the "a way" unit--what was planned and what actually occurred. In other words, a comparative representation in virtual simulation of what was planned contrasted to what actually happened in all relevant matrices of the tactical decision process for "a way" execution. For example, for training purposes, create the "a way" Fire Support or Synchronization Matrix--intended compared to actual with commentary explaining the differences.[3] Although the entire matrix should be available, only that portion up to the moment of initiation should be provided to the "your way" unit to develop context. The remainder

[3] This is a very challenging developmental requirement. While it would be useful to be able to prepare this of "your way" execution for AAR purposes, for now the requirement must be limited to "a way" execution--staged, recorded, and packaged off line, not real time, to support the "your way" AAR.

could be used in the AAR or for "cut and paste" to support staff officer or staff team training.

- FRAGO and various standard reports on all nets from the start of the "day of battle" up to the instant of initialization.

Immersion-assisting new training support enabled by new and emerging technologies should be used whenever possible in creating the contextual material. This should include but not be limited to:

- Plan View Display: Dispositions at the instant of initialization as well as time-compressed snapshots of significant actions by subordinate unit and by BOS on the battlefield for the period from the start of the "day of battle" to the moment of initialization. Enemy dispositions could be shown in their entirety or as edited to reflect only that which the friendly forces have acquired up to the instant of initialization for the particular Table.
- Stealth: Views from the AFV of the Commander, S3 and Company Commanders of "a way" up to the moment of initialization. NOTE: It may facilitate setting context as well as AAR if Stealth views are provided of important locations such as Named Areas of Interest (NAI), and Decision Points (DP) arranged as arrayed in the "a way" Execution Matrix. Any train .g-effective combination of doctrinal array or "a way" replay up to the instant of initialization could be portrayed. After execution by the unit in training, those actions could also be available for AAR comparison purposes.

In addition, other material from the AAR of the "a way" Battalion TF could be made available as it would assist in setting context. It seems more likely, however, that this information may be most useful more for the pretrain of the chain of command, the OCs, or the OEs preparing to conduct the training rather than the unit staff as it executes BCST. Another area for TEA.

- Television coverage of important interpersonal communications such as:
 - "the "a way" commander and key personnel receiving the brigade order,
 - the conduct of the brigade rehearsal with attention focused on the "a way" Battalion and BOS support of that Battalion,
 - the "a way" Battalion Orders Group receiving the order and subsequent rehearsal
 - quick discussions of options and problems at the TOC map board.

It should be evident from above that a formidable challenge in creating context is being met with really new technology applications. To return to the train analogy, rather

than catching up by leaping from platform to passing train, the individual staff officer and staff team will be integrated or "beamed up" into the ongoing Battalion "fight" through a series of highly structured 4D training experiences in virtual reality which immerse the participant in the fight right to the moment of initiation. The technology challenge is to enable 4D routinely. The training challenge is to structure the experience such that it can be done in 20 to 30 minutes as an individual and collective experience.

Conceptually, establishment of vertical context should be done in the same manner. Immerse the vertical staff team in the flow of the BOS throughout the "day of battle."[4] The challenge is to recreate in 4D the interactions within the BOS to the instant of initiation of the Table. For example, if the Table is Fire Support and the training audience is at Brigade, Battalion, and Company, the challenge is to make the Fire Support Plans at each echelon "live" interactively in virtual reality. The Systems Approach to Training--the rigor of task analysis--defines in sufficient detail what must happen. That is the rigor of AFATADS. Distributed virtual simulation creates the seamless battlefield. Both must be matched to recreate the "a way" Fire Support in 4D. Then vertical context can be established as is horizontal. The staff officers and staff teams are immersed in observing 4D planning, preparation, and execution of fire support "a way" up to the moment of Table initiation. Then it is their fire support as they direct fire support for "your way" accomplishment of the tasks to MOP and MOE established by the Table.

This flow of increasing immersion in 4D representation in virtual simulation should set context rapidly. In so doing, it may provide even more. This kind of experiential learning stimulated by immersion may train and educate understanding of the interactions of time and space applicable for the Total Force. Detailed 4D documentation of "a way" in virtual simulation promises to be powerful training support.

The problems of setting the context are considerable. Documentation of "a way" in the level of detail required will be a complex task. Then there must be a great deal of training development to structure the 4D individual and small group training. For example, a "living" 4D Synchronization Matrix will generate new operational and training insights and requirements at each echelon. But when the documentation is done, even if narrowed

[4] It is very difficult to predict how long a period of time will have to be included in order to reflect all of the BOS interactions/decisions to the moment of initiation. The higher the echelon represented, the longer the period which must be represented to portray the full planning and BOS allocation cycles. Of course, all of the planning time does not have to be used by manned staffs. Some planning can be represented in Semi-automated or Intelligent forces. Much more work is required in this area.

to solely basic defend and attack missions, there will be sufficient material to ·/oluti nize staff training--both resident and nonresident. Running and rerunning a particu· · · mbat action "a way" or "your way" in TES (virtual or constructive) will be simple. ·· ·ient return to the same scenario supports rapid common context--and saves precious u··· ·e. Addition of Staff Action or Reaction "What ifs" encourages local innovation. Ar· by virtue of distributed simulation, all can be executed to standard distributed to the h· armory. Tough problem but the reward seems worth it.

APPENDIX 3.4

TABLE TRAINING SUPPORT

APPENDIX 3.4
TABLE TRAINING SUPPORT

There is clearly a substantial infrastructure associated with implementation of BCST. For the purposes of this Appendix, I define training support as the totality of what is required to enable BCST employing immersion in virtual simulation and distributed with quality control for Guard training. The purpose of this Appendix is to summarize the various development actions which will be required to implement the training concepts of BCST, initially the Proofs of Principle (POP). Some of the eventual infrastructure requirements can be alleviated in the early stages by manual "work-arounds" in Proofs of Principle, as will be suggested. They will need to be resolved before BCST can be implemented in more than isolated situations.

Several technical problems need to be resolved both in the development of distributed virtual simulation and in training development. First, simulation technology development:

- A block of "high resolution" digitized terrain needs to be made available for both CATTC at Ft. Knox and for use at the Guard distributed sites--McCain and M-SIMNETs.[1] The terrain should be at least 50 km by 50 km. The NTC and Guard MTA terrain are leading candidates. To permit TEA examining BCST Table execution in various forms of TES, particularly constructive (JANUS) and virtual (SIMNET), it would probably be best to use Knox initially. Subsequently a terrain data base should be prepared for the LTA/MTA of the test round up/round out units.
- Effective automated and semi-automated force representation capability is required. Current OPFOR small unit doctrine desired by the Proponent for training purposes should be available. Regimental-size formations need to be able to be represented in M SIMNET if any Battalion echelon BCST is contemplated. Hopefully this level of OPFOR activity could be "fought" with proper responsiveness by several SME. For POP purposes, additional SME support will probably be required. AFOR (MCC) capability should be expanded to represent more BOS in the same way that CSS and Fire Support

[1] Involvement of the 48th Bde GAARNG will require that this be facilitized at Ft. Stewart.

are represented today. Important current shortfalls in representation are air defense units; NBC contamination; mines including FASCAM and representation of obstacles in addition to soil/water; and lastly, intelligence collection-GSR. For further discussion, see Encl., App. 2.2, Combined Arms Battle Task Training in SIMNET. Platoon- and Company-level small unit Tactical Tables can be conducted in virtual and subsistent (MILES) simulation without these improvements. Battalion echelon horizontal BCST requires the above but training benefit can be sustained by "work-arounds." Vertical BCST beyond Fire Support requires improved representation--in AFOR (IFOR) until higher echelon units can be represented.[2]

- The simulation must be capable of distribution to the unit armories, preferably down to the Company echelon. This is not only from a proponent location such as Knox, Benning, or Rucker, but also from one unit armory to another within a battalion which may be spread across a state. Distribution to the user is such an important part of the model that it should be a "showstopper" for execution of a POP. NOTE: This does not infer that all locations must have AFV simulators. A screen interface to the virtual battlefield (Stealth out of window) or vertical Plan View Display will be sufficient for many BCST tasks. The key is easy communications from one distributed location to another at times convenient to the various requirements of the users--and on equipment that has proven training effectiveness.
- The last simulation technology requirement is that there be sufficient data capture capability to record important BCST MOE and MOP as they are being performed "your way" by the unit in training. The Data Logger currently used for combat development purposes at Knox, SIMNET D, provides an excellent start for BCST CATTC POP uses. The Unit Performance Assessment System (UPAS) discussed above in Chapter 2 would appear to provide excellent initial lower cost collection capability but it is limited to Maneuver and some Command and Control and Fire Support at present. Suffice to indicate that the majority of the important MOP and MOE must be amenable to capture, automatically or manually before a POP is feasible. All of the AAR collection other than human interaction (body language, etc.) should be automated eventually.

There are also challenges on the training development side:

- "A way" execution in virtual simulation has to be captured in sufficient detail that the MOP and MOE are present, properly represented such that the proper cues appear, and structured such that the "day of battle" can subsequently be

[2] This representation may be best achieved in constructive simulation (CBS-BBS) rather than virtual simulation (SIMNET/CCTT). This needs to be determined, probably by TEA.

disaggregated so the Modules necessary for Staff Task Proficiency and Battle Staff Effectiveness training can be created. Both Tables and Modules need to be created. Manual substitutes such as still photos of events or actions not capturable in virtual simulation are acceptable at this stage for use at CATTC and M SIMNET.

- Context orientation has to be designed such that the unit can transition effectively to execution of "your way" in a brief period. That is, the "your way" unit can step into the shoes of the "a way" executors at the moment of Table or Module initiation. The objective is 30 minutes. One hour should be sufficient for the POP. As discussed in App 3.3, this is a formidable challenge. It may be advisable to use one scenario Deliberate Defense for all Table and Module support.
- The AAR needs to be assembled rapidly from the array of MOP and MOE captured during the "your way" execution. NOTE: The same challenge exists for the Proponent in creating the "a way" AAR. But the Proponent has much more time. The unit is not sitting there waiting to hear how it did. For the POP and subsequent fielding, AAR preparation in 30 minutes is a starting objective. Once fielded, the AAR should be available in 15 minutes.
- All of the personnel associated with the training will have to be prepared. The chains of command of the units for the POP will have to be briefed in detail as to the purposes and training strategies being employed in the program. What are the specific objectives? How will they be achieved? How will that achievement contribute to the readiness of the unit? The issue here is not just dutiful compliance with the commitments of the chain of command. Young leaders (officer and noncommissioned officer) need to understand in depth what is being attempted so they will be proactive contributors to the development process.

Potentially more challenging is the preparation of the direct support Subject Matter Experts who are a critical part of the training experience--the OCs and OEs. OC training should not be difficult. The preparatory training for OCs prior to service at CTCs is excellent. The major add-ons should deal with the unique aspects of virtual simulation as they have been described in this Paper. There must be detailed understanding of the opportunities and difficulties in ensuring that the cues for the MOP and MOE are in fact evident to the staff in training. There are interpretation responsibilities associated with TES (virtual simulation) that the NTC veteran accustomed to TES (subsistent simulation) is just

not used to. But these are not significant problems. The concept of OC is well embedded in Army culture as well.[3]

The OE problem is different. It will be substantial. The concepts of Battle Staff Effectiveness were developed by Olmstead when the Army was groping with Organizational Effectiveness (Organizational Development). Special training had been established for Organizational Effectiveness Staff Officers (OESO). These individuals were then posted out to units to facilitate (literally and figuratively) improvement in the organizational processes within a unit. The focus was unit garrison communications--directly relevant to equal opportunity--not effectiveness of processes for tactical decision making. Olmstead's insight--among many--was to use the OESO almost in lieu of OCs (the tactical chain of command conducted the tactical training in Cardinal Point in 1978). The model developed in Chapter 2 calls for both OCs for assisting the chain of command in training Staff Task Proficiency and OEs to support Battle Staff Effectiveness training.[4] OEs will have to be created. The training archives should have the Programs of Instruction for the now defunct OESO School at Fort Ord, California. There is considerable residual expertise available, active and retired, led by Dr. Joseph Olmstead and Col (Ret.) Mike Malone, who could provide valuable counsel in creating the "tactical" OE for Guard BCST. But OE training has to be done before the POP.

- The last training development challenge is continuing evaluation of the process itself. As suggested above, two Tables and two Modules should be prototyped and assessed. The two Tables are horizontal: Battalion TF Defend, Execution and vertical: Fire Support. The two Modules are S2, S3, FSO small staff team and S4 individual staff officer. A structure needs to be created to conduct ongoing Training Effectiveness Analyses of these various training developments. Are they achieving the postulated training effect? At projected cost? The Army Research Institute seems a capable organization for such a mission. It needs to be activated early in the BCST development process.

Technical and training developments are necessary but not sufficient to BCST. A supportive training environment needs to be established. When the unit is conducting "your way" execution of a Table, the Battalion TOC should be set up exactly as SOP would

3 That applies to horizontal BCST. Very little work has been done on the use of OCs for vertical BCST. The Battle Command Training Program (BCTP) has initiated functional evaluations but it has been difficult to performance-base the training. See the discussion on the ARI-Leavenworth-developed evaluation system--ACCES--in Chapter 2.

4 Hopefully, mature BCST will combine OC and OE and reduce the training support cost. Initially, however, both OC and OE appear necessary.

have it in the field. If the Commander and S3 are out overlooking the battlefield with a line Company or a command group, they should be in the proper vehicles (AFV simulators) observing the virtual battlefield through their vision blocks. Each of the staff members should "see" the battlefield as he or she would in combat. If their "view" is gained from listening to radio net transmissions and visualizing the flow of battle from a tactical overlay on a map, that is how they should operate for BCST in virtual simulation. The problem for the training developer is to create this environment --both in the CATTC and in M SIMNET for POP.

When the unit is establishing the context for the "your way" Table, they should be in whatever configuration most facilitates effective training. Training support equipment for this stage should be whatever combination of Stealth, PVD, TV Tape or audio tape works. The same general rule should apply for the "your way" AAR.

As the most effective single training experience of BCST, the "your way" AAR should be conducted where the individuals are warm, relatively comfortable and surrounded by the most effective training support possible to bring out the MOP and MOE associated with the particular Table. This mix will have to be determined by TEA.

This general guidance--use whatever works best--applies also to use of all of the "a way" material. If the unit in training is observing Table execution by the "a way" unit, the staff should be placed where the commander and OCs, OEs believe they can best learn. Sometimes it will be in the TOC, on the vehicles. Other times, it will be grouped in an AAR type area for most effective group learning. The development challenge is to provide these kinds of flexibility for the POP.

APPENDIX 6.1

REQUIREMENTS FOR BCST IN INSTITUTIONAL TRAINING

APPENDIX 6.1
REQUIREMENTS FOR BCST IN INSTITUTIONAL TRAINING

Conceptual development of BCST drawing on advanced distributed simulation has focused to this point on the development of BCST conducted in units. There is no comprehensive accepted task list of BCST requirements for training in units. Therefore the analysis essentially executed "backward planning." Since the AAR is the most effective training tool, the training events (Tables and Modules) are designed to generate the desired AARs. That is, creating MOP and MOE necessary to train to task proficiency in the AARs drove the design construction of the initial Tables and Modules. They were structured to cause the MOP and MOE required for effective training to be generated. This "first approximation" for development will be honed in subsequent Training Effectiveness Analyses.

The challenge is substantially different in institutional training. Some BCST tasks embedded in POI are currently trained at the service schools and Leavenworth to prepare commanders and staff officers. These POI are under continuing review, stimulated by the training development "crucible" of the CTC and the reality of combat--Desert Storm. Therefore to assess the feasibility of the BCST model being proposed for institutional training (Context, Table or Module, AAR), the training potential of Tables and Modules should be compared to both the existing POI of institutional training and to probable evolution based on feedback from the field. If all or more than is currently trained institutionally is feasible with the proposed model, the new methodology should pass its first test of sufficiency. The purpose of this Appendix is to make that check. It is not a task-by-task analysis but rather an assessment whether the potential is present in the BCST model to train both vertical and horizontal BCST. This check is necessary for both present courses and as command and staff is being revised for future course improvements.[1] In

[1] This analysis focuses on Total Force warfighting BCST training. Staff training requirements are generated by active force combat units reflecting experience. AC training problems are assumed to translate directly to RC with equal or greater impact--due to reduced time for training of citizen-soldiers.

fact, consistent with the research thrust of NGB/DARPA, the proposed BCST training should be a dominant solution to the command staff training challenge.

Two comparisons are made. First, compare BCST to the POI of the current Battalion level pre-command course, the Tactical Commander's Development Course. This course consists of refresher training deemed necessary for commanders, both active and reserve, prior to going into command. The course requires future commanders to actually do the staff work required for Planning, Preparation and Execution of two missions--Defend then Attack. Review of these training requirements is a useful assessment of the tasks seasoned successful commanders expect from their staffs. If the proposed BCST trains these tasks, it could be useful for pre-command training and perhaps for general combat arms staff officer training.

The second screen reviews the content of the current command and staff training conducted at the Battalion echelon. That is the POI of the current Officers Advance Course. Since this Paper concerns armored forces, the OAC at Ft. Knox is reviewed. Neither the current Combined Arms and Services Staff School at Leavenworth (CAS3) nor the Command and General Staff College at Leavenworth are included. They are institutional staff officer training but both focus above brigade echelon at present. The BCST training challenge of this Paper is battalion and brigade.[2]

Then we shall consider concerns that have been raised about current command and staff training as well as planned revisions of training in the institution. Does the BCST model proposed respond to the concerns? Will it accommodate revisions currently under way?

CURRENT BCST--TCDC

Battalion echelon TCDC is a two-week course taught at Ft. Leavenworth in a small group mode for both AC and RC. Battalion command selectees are grouped (six to ten) by heavy or light unit deployed in CONUS or overseas. The course is taught by extremely competent instructors, experienced combat arms Majors or Lt Colonels. They act as Mentors, Facilitators, and OCs, dependent on the substance or tone appropriate to the dynamics of the small group. The surrogate student "commander and staffs" address

2 Future CAS3 RC should address some Battalion echelon staff tasks. "Many common core subjects and staff skills presently taught in OAC-RC will be taught in the newly implemented RC-CAS3 course," Msg: Cmdr TRADOC, Subject: RC Officer Education System, 251327Z July 1990. CAS3 content will be discussed in greater detail below.

tactical situations associated with deliberate defense then attack as portrayed on maps, terrain boards, audio and TV of CTC "case studies" as well as constructive simulation (JANUS). Each student is expected to be prepared to respond to each requirement as the Battalion Commander. Essentially, the Battalion Heavy students plan, rehearse, execute in JANUS then AAR two tactical missions at the National Training Center. The course is divided into the following lessons:

Tactical Commanders Development Course[3]

Lesson 1.	TCDC Overview
Lesson 2.	The JANUS Simulation
Lesson 3.	Defense Command and Control Exercise
Lesson 4.	Task Force Synchronization
Lesson 5.	Brigade Defense Operation Order
Lesson 6.	Mission Analysis and IPB
Lesson 7.	IPB: Threat Evaluation and Integration (Defense)
Lesson 8.	Battalion Task Force in the Defense
Lesson 9.	Task Force Course of Action Development
Lesson 10.	Security Operations
Lesson 11.	Defensive Operations in the Main Battle Area
Lesson 12.	Contingency Operations
Lesson 13.	Rehearsal Techniques
Lesson 14.	Task Force Defense Rehearsal and OPORD Execution
Lesson 15.	Brigade Offense Operation Order
Lesson 16.	IPB: Threat Integration (Offense).
Lesson 17.	Course of Action Development
Lesson 18.	Organization of an Assembly Area
Lesson 19.	Reconnaissance and Surveillance
Lesson 20.	Tactical Movement and Passage of Lines

3 Source for TCDC material is: Advance Book (Heavy Battalion Task Force), "Tactical Commanders Development Course," U.S. Army Command and General Staff College, January 1992. Terminal Learning Objectives and Tasks are extracted from course Advance Sheets.

Lesson 21. Tactical Formations and Actions on Contact

Lesson 22. Obstacle Breaching and Actions on the Objective

Lesson 23. Task Force Offense Rehearsal

Lesson 24. Task Force Offense Practical Exercise

Lesson 25. Summary and After Action Review

Leavenworth describes the course as follows:

Scope

The Tactical Commanders Development Course curriculum is 80 hours (+) of instruction, which allows battalion command selectees to focus on the synchronization of combat power at the task force level. The course will focus on honing tactical skills and knowledge in the application of combat power on the AirLand Battlefield. This comprehensive course emphasizes the fundamentals of combat operations, emphasizing battlefield functions and the roles they play in offensive and defensive operations. You will apply AirLand Battle Doctrine and exercise tactical judgment in various operations and will discuss doctrine that applies to the tactical operation under study, devise solutions and plans for each operation, exercise those plans using a computer simulation, and participate in after action reviews.

TERMINAL LEARNING OBJECTIVES

A. TASK: Demonstrate proficiency in synchronization of task force battlefield activities.

CONDITION: Given a two-week course, tactical scenarios, classroom environment, and a JANUS computer simulation.

STANDARD: Synchronization of battlefield activities must be IAW FM 71-2, The Tank and Mechanized Infantry Battalion Task Force, and ARTEP 71-2, Mission Training Plan for the Tank and Mechanized Infantry Battalion Task Force.

B. TASK: Analyze enemy doctrinal framework, organization, equipment, and offensive and defensive tactics for ground forces.

CONDITION: Given maps and/or sketches, micro-armour models, tactical requirements, student notes, and other applicable references.

STANDARD: The analysis must relate the doctrine, concepts, and principles governing threat military organization and equipment; ground forces organization for combat at the tactical level; and the conduct and control of offensive and defensive combat at company level and above, including combat support. The analysis must be IAW threat references provided in class; FM 34-80, Brigade and Battalion Intelligence and Electronic Warfare Operations, FM 34-130, Intelligence Preparation of the Battlefield and FM 71-2.

C. TASK: Conduct Intelligence Preparation of the Battlefield (IPB) to support tactical decision making at the task force level.

CONDITION: During class discussions and practical exercises, given an assigned area of operations, preliminary weather and terrain products, enemy doctrinal templates, and a friendly course of action.

STANDARD: The student IPB products will include situation template(s), an event template, and a decision support template to support a wargamed task force course of action for combat operations in the offense and defense. Products should meet minimum standards as outlined in FM 34-80, FM 34-130, and FM 71-2.

INSTRUCTIONAL METHODS

Instruction will be at the small group level, with each group required to solve the practical exercises. The course is divided into two weeks, one for defense and one for offense. Teaching methodologies are similar for both. Each team member will function as the maneuver task force commander and present his solution(s) as directed by the instructor.

You will think, analyze, plan, decide, and communicate orally and/or in writing. You will apply the Principles of War in every tactical requirement. Your inquiry, discussion, and debate will be important parts of attaining course objectives. In short, you will exercise and develop tactical judgment while working within the intent of the higher commander.

To complete the practical exercises, you must do extensive reading before class. Class work time is at a premium.

p. 2

While the course expects each student to be able to respond to each requirement as the commander, in practice the students are grouped into one or more staff teams to address the requirements. There is a great deal of individual staff officer performance expected from each student. This BCST focus is evident in the homework assignments grouped below by night of the course:

Complete TF 1-77 Mission Analysis and Warning Order and Commander's Initial Time Analysis

Develop Planning Guidance and a Concept of the Operation

Develop Main Battle Area Plan (Emphasize Direct Fire Plan)

Develop Security Plan and Refine Main Battle Plan

Set up Rehearsal Site; Complete Maneuver and Fire Support Execution Matrices

Complete TF 1-14 Mission Analysis and Warning Order and Commander's Initial Time Analysis

Analyze Course of Action; Prepare Assembly Area Organization

Prepare Passage of Lines Plan

Develop Detailed Security Plan

Plan the Actions on the Objective

Plan the Breaching of Obstacles

Prepare Maneuver and Fire Support Execution Matrices.

p. 7

While synchronization of combat power consistent with the commander's intent is the clear focus of the course, training requirements are established by feedback from units. Field experience dictates that each of the Battlefield Operating Systems is discussed. For example, in developing a task force defense course of action, the student is expected to:

g. Seventh requirement. Be prepared to discuss the following questions concerning the combat service support plan that supports your course of action.

(1) How will you keep the engineer vehicles refueled?

(2) What are your maintenance priorities by vehicle?

(3) Given that you can feed one hot meal a day, what is your ration cycle?

(4) Calculate the day and night travel times from the BSA to the task force sector. What effects do these times have on resupply of the task force?

(5) What is the composition of the combat trains?

(6) What is the composition of the UMCP?

(7) What does "fix forward" mean?

(8) Where is the "mine dump"and who works there?

pp. 53-54

This is solid S4 logistic planning. Similar substantive knowledge is expected in the other BOS.

Concerned about the effectiveness of the course, Leavenworth asked ARI to survey current battalion commanders as to the adequacy of TCDC. The results were quite positive:

EXECUTIVE SUMMARY

Requirement:

The Commander of the Combined Arms Center asked ARI to interview graduates of the battalion level Tactical Commanders Development Course (TCDC). TCDC, which is part of the School for Command Preparation at Fort Leavenworth is a two-week course for officers designated to become battalion commanders. The purpose of the interviews was to provide information to TCDC which would allow TCDC to assess the effectiveness and guide the future development of the course.

Procedure:

Forty-eight battalion commanders were interviewed upon their return from either NTC, JRTC, or Desert Storm. Both graduates and non-graduates of TCDC were interviewed. At the time of the interviews, the commanders had been in command for an average of one year. The commanders provided their overall assessment of TCDC's strengths and weaknesses and recommended improvements to the course. The commanders discussed problem areas in tactical command and control, areas that they believed the course should address. Also, they gave their advice and opinions about a variety of tactical issues including commander's intent, the planning process, decision support tools, rehearsal techniques, battle drills, training, and leadership.

Results:

The assessment of TCDC was very positive. Almost all believed TCDC to be one of the best courses in the Army. The commanders also described positive impacts the course made on their performance, whether at a combat training center or in combat. Some aspects of TCDC that were considered especially valuable were the classroom discussions in general, the interaction with other branches, the emphasis on how to be faster in planning, the treatment of rehearsal techniques, and the course handouts and battle book.

Most of the recommended changes to the course involved including material that the commanders felt was important but had not received enough attention in the course. Some of these topics are: CSS functions in general, fratricide, psychological aspects of combat, monitoring and controlling execution, and planning and preparing when time is limited. Also, there was an overall desire to see the course lengthened by about a week (often at the expense of the Pre-Command Course). Two areas that drew some negative comments were the portion of the course on Intelligence and use of the JANUS simulation. Overall, however, these two aspects were viewed positively by more officers than viewed them negatively. JANUS was

called a great training tool by many of the officers, and several singled out the IPB and threat laydown as the most beneficial parts of the course...".[4]

TCDC is clearly a success. Not only has it trained individuals but, also, it has trained unit staffs from tactical units both active and reserve on a noninterference basis with PCC. Impressed by the results, the National Guard Bureau is seeking to institutionalize this unit staff training although institutionalization will probably be in a new Team of BCTP under CAC-T supervision rather than within the C&GSC as at present.[5] This quality training is clearly desirable. Is it feasible for resident, non resident-regional and perhaps non resident local training?

I have examined the Terminal Learning Objectives and the Tasks, Conditions and Standards trained in the current TCDC. Further, I attended Battalion level TCDC in its entirety--defense with one small group and then attack with another. I conclude that the BCST model proposed is not only "doable," it also draws heavily on the instructional concepts presently embedded in TCDC. However, there are uncertainties, both positive and negative. JANUS is effective but time-consuming to set up. There is occasional immersion of the students in the simulation--perhaps 10 percent of the time. The combination of virtual and constructive simulation envisaged in the BCST concept should increase immersion significantly. This should improve the already high productivity of the course. On the other hand, TCDC profits enormously from the extraordinary competence of the instructors. This will be difficult to match in regional and local instruction. Quality control of OCs and OEs is imperative. There will be good and poor personnel selected as OC/OEs. On balance, the proposed ECST model (Context, Table or Module, AAR) is capable of training the TCDC POI.

REVIEW OF CURRENT OAC BATTALION STAFF TRAINING

The current Officers Advance Course RC focuses on both company and battalion level responsibilities.[6]

4 Lussier, J.W., and D.J. Litauer, "Battalion Commander Survey: Tactical Commander Development Course Feedback," ARI Leavenworth, Draft, March 3, 1992, pp. vii, viii. Underlining by F.J. Brown. General concern about JANUS centers on setup time.

5 Fax Maj T. Allen, Subject: Requested Information, September 28, 1992.

6 This Paper focuses on the training of heavy units. Therefore the institutional training of the Armor Center is selected for review and comparison. Documentation is POI 171-BR 12-RC, "Armor Officer Advanced Course-USARF School," 17 January 1991.

SCOPE: The program consists of three phases which include company/team armor tactics, commander responsibilities in administration of training at the company level, computerized tactical exercises via simulation networking (SIMNET), common subjects, and advanced armor and cavalry specific Bn/TF tactics. Phase I is Active Duty (ADT) conducted at Fort Knox. It provides the student an intensive tactical and training management foundation. Phase II A is Inactive Duty Training (IDT), and is the common core developed by the Combined Arms Training Center, Fort Leavenworth, KS. Phase II B is IDT and includes armor specific correspondence courses. Phase III is ADT conducted at Fort Knox and teaches Bn/TF level tactics.

p. 3

Phase I is entirely at the Company echelon. Phase IIA, common instruction prepared at Leavenworth, contains some material appropriate to battalion staff training. Of 104 hours of paper-based material, 27 are directly relevant at battalion:

Staff Procedures in Tactical Units
Command Post Functions and Organization
Plans, Orders, Annexes, and Symbology
Threats
Mass Casualty Management/Battle Fatigue
Defensive Operations
Retrograde
Offensive Operations
Tactical Air Operations
Tactical Communications
CSS Doctrine Overview
CSS Planning Overview
Convoy Operations
Unit Movements
Combat Logistics Supply and Support
Wartime Unit Personnel Support

pp. 26-27

Phase IIB provides paper-based correspondence course training designed for the Armor Company commander. Of 100 hours, 96 are relevant at battalion:

Intelligence Preparation of the Battlefield (IPB)
Movement Planning
Cavalry in Airland Battle: Organizations and Missions
Cavalry in Airland Battle: Reconnaissance
Armored Cavalry Screening Operations
Armored Cavalry Guard Operations
The Army Electronic Warfare Program
Introduction to Field Artillery Organizations and Missions
Tank and Mechanized Infantry Battalion Task Force
Part I: Organization/Command and Control
Tank and Mechanized Infantry Battalion Task Force
Part II: Offensive Operations
Tank and Mechanized Infantry Battalion Task Force

Part III: Defensive Operations
Division Artillery
Combat Orders and Plans
Obstacle Employment
Operations Security
Battlefield Deception

pp. 29-34

The guts of the battalion level instruction occurs during Phase III taught at Ft. Knox. Because of the importance of this block of instruction to assessment of the BCST concept, the scope of this training is included: Phase III is 94.5 hours (excluding two 7-hour tests), all in the classroom--Conference or Practical Exercise (Map Exercise) drawing on Computer-Based Instruction (PLATO) and terrain boards with micro armor. Testing consists of a requirement to write two complete 5-paragraph operations orders. The title below is followed by the number of hours of instruction and the scope:

Graphic Control Measures: 1

Students discuss and have practical work in the functional application of unit symbology, defensive/offensive graphics, and logistical graphics as they apply to operations at the BN/TF/SQDN level.

Introduction to Tactical Operations: 3

Students will be introduced to and discuss Airland Battle doctrine as it applies to the tactical level of war. In addition, BN/TF/SQDN battle staff functions will be presented along with a discussion of tactical command posts and radio nets.

BN/TF CS and CSS: 4

Students will attend multiple conferences on the defensive/offensive capabilities and employment of ADA, FA, ENG, Combat Service Support assets at the BN/TF/SQDN level.

BN/TF Offensive Ops/IPB and Estimate: 10

Students will be introduced to BN/TF/SQDN offensive formations, movement techniques, and tactics. Students will apply IPB principles in conjunction with a BN/TF/SQDN deliberate attack, and then conduct practical work in mission analysis, issuing a Warning Order, and completing the five basic steps of the Operations Estimate.

Tentative Plan: 3

Students will use a selected Course of Action from (Preceding) and develop a BN/TF/SQDN deliberate attack tentative plan integrating terrain recon, combat multipliers (CS/CSS), and limited visibility considerations.

Passage of Lines/Road Movement: 3

Based upon terrain reconnaissance and classroom discussion students will prepare a tactical road march and forward passage of lines plan for inclusion

in the BN/TF/SQDN deliberate attack OPORD. This plan will contain operational graphics, critical instructions, and required coordination with the stationary unit.

BN/TF Offensive TEWT: 4

Students will plan, perform, and conduct a leaders reconnaissance using the factors of METT-T to assist in evaluating BN/TF/SQDN deliberate attack courses of action.

Reconnaissance and Surveillance Planning: 3

Students will discuss the linkage between the BN/TF/SQDN event support template, intelligence requirements, and available reconnaissance assets. Following the discussion students will prepare a BN/TF/SQDN defensive/offensive recon and surveillance plan, and brief their solutions.

Develop the Plan/Consolidation and Reorganization: 10

Students will conduct discussions and practical work on assaulting the objective, integrating CS, actions on the objective, consolidation, reorganization, CSS operations, and locating the BN/TF/SQDN Main CP.

Deliberate Attack: 10

Students will discuss the development of the BN/TF/SQDN OPORD, and then prepare paragraphs 1 thru 5, operations overlay, and CSS overlay to the deliberate attack OPORD.

BN/TF TOC Operations: 2

Students will discuss the physical layout, organization, and internal function of the BN/TF/SQDN main CP.

BN/TF Defensive Ops and Troop Procedures: 5.5

Students will be introduced to and discuss the principles of U.S. Army defensive doctrine and defensive operations/tactics at the BN/TF/SQDN level. Students will discuss the eight Troop Leading Steps, and conduct practical work in mission analysis and issuing a Warning Order for BN/TF/SQDN defense in sector.

Intelligence Preparation of the Battlefield: 9

Students will discuss the IPB process in conjunction with the BN/TF/SQDN defense in sector and conduct practical work: in battlefield area evaluation, terrain/weather analysis, threat evaluation, and threat integration.

BN/TF Operations Estimate and Tentative Plan: 6

Students will develop a BN/TF/SQDN operations estimate to include courses of action, analysis/comparison of the COAs, and making a tentative plan for a defense in sector.

Develop the Tentative Plan: 7

Students will discuss and perform practical work in planning counter-reconnaissance, battle handover/passage of lines, direct/indirect fire, obstacle planning, and rear battle.

BN/TF Defensive TEWT: 4

Students will prepare a reconnaissance plan and conduct a reconnaissance to verify their tentative plans for a BN/TF/SQDN defense in sector.

Defensive OPORD: 10

Students will discuss the development of the BN/TF/SQDN OPORD, and then prepare paragraphs 1 thru 5, operations overlay, fire support overlay, and obstacle overlay to the defense in sector OPORD.

BN/TF OPORD Test: 7

Students will be tested by a performance test requiring them to write a complete 5-paragraph defensive BN/TF operations order (OPORD) and construct the supporting graphic overlays.

BN/TF OPORD Test: 7

Students will be tested by a performance test requiring them to write a complete 5-paragraph offensive BN/TF operations order (OFORD) and construct the supporting graphic overlays

pp. 35-40

The current OAC-RC is distinctly inferior to the BCST training proposed in conceptual BCST.

- There is no specific functional training for any staff position. BCST develops Modules specifically focused on individual staff officers and small staff teams. Current institutional command and staff training is simply not rigorous other than in the formal staff processes. Some would assert that this process may be overly proceduralized. If so, the current OAC-RC reinforces the problem. BCST as proposed today is not the certain answer. There are admittedly weak task analysis areas in BCST which need to be filled out after TEA but there is a comprehensive structure to focus rigorous development both horizontal and vertical.
- The OAC-RC preparatory material is entirely paper-based. The instruction at Knox is classroom-oriented. Terrain boards and micro models are useful if the student has sufficient experience to compensate in the "minds eye." That battalion-level experience is generally lacking in the RC training audience. BCST, whether in constructive or virtual simulation, transports the student to a highly interactive environment involving immersion in tactically challenging situations. Hopefully that technology will be applied also to home or worksite

preparation in interactive simulation so that the student is provided context to back up doctrine, tactics, techniques and procedures.

- The current OAC-RC POI addresses only the Planning phase of the Plan, Prepare, Execute model. BCST addresses all three with interactive personal involvement.
- Terminal proficiency for OAC-RC is the ability to prepare two operations orders. There is no assessment of the challenges of execution. With the combination of "a way" and "your way" in both Table and Module and in AAR, BCST engages the student in the challenges of Preparation and Execution with an option of training multiple simultaneous mission staff actions (Monitor, Plan, Direct).

In sum, very little of current CTC-based training development is present in the current institutional course. The combination of upgrade to CTC technology, combined with thoughtful addressal of staff functional training and new technologies permitting some degree of immersion in interactive "warfighting" should produce an OAC-RC which is dominantly better.

CURRENT CONCERNS AND FUTURE PLANS

Not surprisingly, there is general concern about the training of battalion staff officers. An excellent recent study by ARI-Benning examined battalion staff training in light forces.[7] They looked both at the institution and at units training at the JRTC. Their findings are unsettling. Because of their importance to BCST in general, the Summary is cited at length. Underlining is mine. The study deals with six active battalions observed during FY 90. These are active not Guard units. It seems reasonable to assume that the problem is at least equally severe in Guard units.

Summary

The maneuver battalions are central elements to Airland Battle doctrine (FM 100-5, 1986). The majority of this force is comprised of more than 220 Infantry battalions, with 102 active component Light and Mechanized battalions. Half of the active Infantry component (51 battalions) is made up of Light Infantry, Airborne, Air Assault, and Ranger units with an additional 15 light reserve units. These units receive some of their most effective training at the JRTC. Performance measurement at the JRTC is based on doctrine (Mission Training Plans) and Mission Essential Tasks

[7] Thompson, Thomas J., George D Thompson, Robert J. Pleban, Patrick J. Valentine, "Battle Staff Training and Synchronization in Light Infantry Battalions and Task Forces," ARI Benning Research Report, September 1991. Underlining by FJ. Brown.

Lists which are specific to the rotational units. Additional light forces, such as Special Forces, exercise at the JRTC as well. The findings from Light Infantry focused training research with the variety of light forces using the JRTC can be generalized to benefit the total force.

The transient nature of battalion staff assignments, the relatively short periods of continuity officers have on a battalion staff, the reduction of formal staff training (Mason, 1990), and the lack of compliance with officer utilization and development policies (DA PAM 600-3, 1989) have resulted in severe staff training and synchronization problems. Documented observations of unit performance from the CTCs (Crawford, 1990; Fish, Stephenson, and Sisco, 1989; Wells, 1989), as well as the practical signals provided by the establishment of the TCDC and the Battle Staff NCO Courses clearly confirm this assessment.

Current training. DA 600-3 (1989) states that during the first career phase, the basic course provides instruction related to the overall mission and functions of an officer's branch along with technical instruction that provides the detailed knowledge and required skills associated with the branch. Examination of the current MOS 11 revealed no introductory tasks that provided even basic knowledge and comprehension of staff functions. The first staff training objective (S3 Operations) for Infantry and Armor officers is identified in the Advanced Course programs. No evidence of staff functional area training exists for officers in the maneuver branches during the branch oriented phases of their professional development.

The CAS3 prepares officers for staff positions above brigade level. Specific resident S1/S4 training for maneuver branch officers filling battalion staff assignments seldom takes place. The two most common forms of training received by officers in Infantry and Armor battalions are OJT and mentoring, neither of which are perceived as very effective (Thompson, 1990). The absence of formal or structured staff training has not been identified as a problem by battalion commanders and staffs until after the unit has trained at a CTC. The time constraints, fatigue, and lack of skill and experience stresses the primary staff members beyond their abilities. They can not compensate for lack of individual job knowledge and their collective inability to synchronize actions in a continuous operations environment. Current training exercises at home station, apparently no matter how rigorous, do not provide the conditions that consistently identify staff performance deficiencies.

Staff synchronization and integration. The TCDC and the Battalion Staff NCO Course have are aimed at the improvement of enhance staff synchronization. While effective, they do not compensate for the deficiencies in staff functional area training. The maneuver battalion's own staff officers lack branch doctrinal knowledge as do other branch officers (S2, Fire Support Officer, Engineer). These deficiencies in individual knowledge detract from the collective ability of the staff to synchronize activities.

Efficacy of staff integration experimentation. Olmstead's (1990) compelling call for demonstrative experimentation to support his battle staff integration

theory is probably premature because the basic staff skill conditions do not exist to support it.

The Cognitive Role Training requirement in Olmstead's model (1990) cannot be met under present conditions because it assumes that officers will receive at least familiarization training in all staff areas. They do not. The model Olmstead outlines in Battle Staff Integration (1990), requires organizational competence, consisting of: (1) the proficiency of all individuals in their own process performance, and (2) teamwork across all levels so that the performances by individuals are fully coordinated.

The first part of the model is conceptually similar to task training and realistic job previews discussed by Pleban, Thompson, Valentine, Dewey, Allentoff, and Wesolowski (1988) and Premack and Wanous (1985). However, instruction in primary staff roles for maneuver branch officers ended in 1974. Few officers, though not in any systematic manner, have been exposed to either administrative staff training, or logistics and maintenance training only.

The second critical requirement for battle staff integration according to Olmstead (1990), is teamwork, which requires sufficient staff stability for members to learn each other's strengths and weaknesses. The limited continuity of key staff members serving together (4.6 months) observed in typical Light Infantry forces during 1990 are counter to the model's fundamental conditions.

The conditions do not exist in the US Army to test the efficacy of Olmstead's Battle Staff Integration model. In addition, the doctrinal imperative is on staff synchronization (FM 100-5, 1986), which is not completely analogous to Olmstead's theoretical position on staff integration.[8]

Few maneuver battalion commanders have been exposed to battalion level staff training because they are post-1974 advanced course graduates. Commanders have probably served in at least one primary staff position prior to S3 Operations, but not likely in both S1 and S4 positions. What they know about the other staff functions is based on their earlier observations while learning their own responsibilities. They learned how to get things accomplished, but not necessarily with an objective view of the entire staff process. Later, while attending the Command and General Staff College, a different perspective on staff work is gained, but this is not from the perspective of the battalion. The earlier lessons received while "under fire" in a unit are logically the first lessons, or insights, passed on to new staff officers by the battalion commander.

[8] The concern about the applicability of the Olmstead model is appropriate. In fact, knowledge of this report and subsequent discussion with Col Dan Butler, Director TCDC, stimulated focus on both Battle Staff Effectiveness and Staff Task Proficiency as essential ingredients of BCST. Clearly Context, both general and Table/Module specific for the staff position and small staff team, must be established before Table or Module execution. Individual tactical and technical competence is clearly vital to execution of BCST.

> The training received by officers attending the Infantry and Armor basic courses annually represents a significant influence on the Army's maneuver battalions. If current experience can be used to predict future practices, the majority of these officers can expect to fill primary staff positions prior to attending their advanced courses. It is therefore reasonable to identify a way to train these officers for potential staff assignments.....
>
> pp. 34-37

There are clearly major problems with staff training of active forces. The same structural deficiencies apply to citizen-soldiers. Initial corrective action is under way. A quick response has been prepared by ARI Benning. A"Commander's Battle Staff Handbook" is presently under review at the JRTC and at TCDC. Basically the Handbook, described as "an introduction to staff functional skills," includes battle staff duties for the XO, CSM, S1, S2, S3,and S4 as well as primary slice element staff officers, the Fire Support Officer and the Engineer.[9] The following discussion of S1 responsibilities is typical:

> STAFF COORDINATION
>
> As a staff member, the S1 must work closely with other staff members to: facilitate and monitor the accomplishment of command decisions; provide timely and accurate information to the commander and subordinate units; anticipate requirements and maintain current estimates (personnel and loss rate); develop portions of the CSS annex; recommend replacement priorities; determine and recommend courses of action to achieve mission accomplishment; and prepare plans and orders.
>
> The S1 coordinates with the S2 for interrogating prisoners and with the S4 for processing captured equipment and planning transportation requirements. The S1 also coordinates with the medical platoon leader and the medical operations officer to ensure that patient treatment and evacuation are planned and coordinated throughout the battalion area. The S1 also coordinates for religious support with the battalion UMT section. He also assumes public affairs responsibilities since no public affairs assets are available to aid the commander at battalion level.
>
> PLANNING
>
> The planning focus of the S1 centers around the personnel and administrative factors impacting soldier and unit effectiveness. These factors are discussed briefly below.
>
> Unit strength maintenance. In assessing unit preparedness, the S1 must focus on the effects of deployability, losses, critical MOS and skill

9 ARI Light Forces Readiness Team Fort Benning Field Unit, "Commander's Battle Staff Handbook," Draft, 1 September 1992, p. v. Interestingly, ARI Benning envisages shifting to BOS orientation as they develop a similar product for Brigade. Telecon, Author to Dr. Thomas J. Thompson, September 23, 1992.

shortages, projected gains and losses, and any local situations affecting the number of personnel in the unit.

Replacements. The primary concerns here for the S1 include listing critical outstanding replacement requirements, status of previous allocation by unit (when critical to the situation), and location of replacement processing units.

Noncombat matters. The S1 must take into consideration the impact of people, other than soldiers, on the mission of the unit. Examples would include dependents, third country nationals, EPWs, civilian internees and detainees, DA civilians, and personnel available for labor requirements.

Soldier personal readiness. The S1 is responsible for reporting the status of morale and esprit de corps, and any significant influences on the morale of units.

Services support. The S1 must be able to assess and evaluate the adequacy of personnel service and logistical support services as they impact on troop preparedness and recommend new policy(s) or programs where appropriate.

Organizational climate/commitment/cohesion. In planning the battalion personnel service support needs, the S1 may have to carefully consider (depending on the situation) soldier satisfaction with the unit, identification/involvement with the unit, and unit cohesion.

Personnel estimate. In preparing the personnel estimate, the S1 needs to pay particular attention to troop preparedness issues, including unit strength, replacements, noncombat matters, soldier personal readiness, services support, organizational climate, unit commitment and cohesion. For each COA, the S1 assesses the impact of identified problem areas, trends, and deficiencies for a specified personnel factor on troop preparedness.

PREPARATION

The S1 continues to monitor unit strength through reporting procedures established in the unit TACSOP.

EXECUTION

During the execution phase of the operation, the S1 is responsible for ensuring the following seven functions are accomplished accurately, smoothly, and efficiently. The accomplishment of these functions is critical for the effective management of combat-essential personnel information.

Replacement operations. Replacement operations include the coordinated support and delivery of replacements and return-to-duty (RTD) soldiers. It includes orders issuance, personnel accounting, logistical support, processing and transportation. It depends on the strength management function for information on where to deliver replacements and RTD soldiers.

Strength management. Strength management assesses an organization's combat power, plans for future operations, and assigns replacements on the battlefield. It predicts the need for replacements and provides a mixture of individuals and small units. It depends entirely on the personnel accounting and strength reporting function to provide critical strength information to support the information requirements of the current battle. It depends on personnel data base management to support the information requirements of the future battle.

Personnel accounting and strength reporting. Personnel accounting and strength reporting accounts for soldiers, reports their duty status, and serves as the foundation for critical battlefield decisions. Personnel accounting and strength reporting depends on personnel data base management for the necessary tools to manage the reconciliation process.

Casualty management. Casualty management encompasses two functions: casualty operations and casualty management. Casualty operations records, reports, and accounts for casualties promptly and efficiently. It uses postal operations as the means for redirecting the personal mail of soldiers who become casualties. It depends on personnel accounting and strength reporting to locate soldiers who have been evacuated. Casualty management coordinates the personnel and logistical processes involved in casualty management at all levels.

Personnel data base management. Personnel data base management consolidates current and projected personnel information on soldiers and units in a number of command data bases (SIDPERS). This information serves as the basis for command decisions and projected battlefield requirements. It depends on personnel information management and personnel accounting and strength reporting for information from which to update the data base.

Personnel information management. Personnel information management provides a record of critical personnel information about soldiers to support battlefield decisions and to meet the nation's obligation to retain historical information for its veterans. It also provides a manual source of information on skills, grades, numbers, and physical limitations as a backup to the electronic personnel data base.

Postal operations. Postal operations manages and operates a postal network to move, deliver, and collect mail in the deployable force. It delivers official mail, including critical spare parts and medical supplies, and provides an alternative delivery system for personnel information. Postal operations depends on the personnel accounting and strength reporting function to know where soldiers are on the battlefield, and the casualty function to determine the status of casualties and redirect their mail.

CONCLUSION

The S1 is a vital link in the commander's staff as he supervises the health, morale, and general welfare of the battalion. To ensure that the S1 is appropriately utilized, the following information checklists are presented:

What the S1 needs to know from the battalion commander:

- Mission
- Commander's concept of operation
- Commander's intent
- The enemy situation
- Time available
- Chain of command
- How the commander can be located
- Rehearsal time and location

What the battalion commander needs to know from the S1:

- S1 estimate
- Status on the delivery of replacements and return-to-duty (RTD) soldiers
- Unit combat power
- Ability to execute future operations based on present combat strength
- Duty status of soldiers
- Casualty reports
- Unit readiness reports
- Location of the PAC
- Emergency medical and preventive medicine measures
- Reconstitution plan.[10]

This is excellent guidance. It should materially support the development of the Context, Module and AAR for individual staff officer preparation at least for Staff Task Proficiency. The Handbook is designed to support staff training in the unit. Institutional training of the Total Force clearly requires revision also.

Substantial change is under way in officer preparation. As discussed above, the next OAC-RC, already approved for implementation in FY 94, removes Bn TF training from the OAC-RC and places it in a revised CAS3.[11] Meanwhile Ft. Knox is clearly thinking innovatively about the problems raised by the ARI Study. In a recent communication, Dr. Norman Shumate, Director of Training Technology, The Armor Center, charted a future direction for institutional BCST, at least for heavy units:

> ...Staff skills presently taught in RC-OAC will be taught in the new RC-CAS3 Course. USAARMS will pilot new AOAC-RC in FY93 and fully implement in FY94.

10 Ibid., pp. 20-25. Also included but not reproduced are a discussion of S1 Assets, Unit Responsibilities, Primary Duties and a list of Resources for further documentation. All in all, an excellent product.

11 Msg: Cmdr, TRADOC, Subject: RC Officer Education System, 251327Z, July 1990. USAARMC POI 2-17-C23 Phase 2, "Armor Officer Advanced Course--Reserve," Draft. Note that current planning moves staff training up (to Leavenworth) yet ARI-Benning recommends that it be moved down (to the Basic Course) since young officers--pre OAC--serve routinely as AC battalion staff officers. While assignment dynamics are different in the Guard, there clearly is an issue here.

USAARMS' RC3 Branch has been funded to develop a branch specific Bn/Sq S3 course in FY93. Course is currently in a concept stage and many questions need to be answered (such as exact content, length, who will teach to include resourcing for training if AC instructors are to be used), training location(s) to target population (TPU former Co Cdrs, current TPU S3s, IRR). ...Other staff level courses for RC Armor officers (S1, S2, S4, BMO) are also under consideration for development in FY94 and beyond.

Our current concepts for the Bn/Sq S3 course include:

- 2 week ADT.
- Small group instruction relying heavily on student participation, including individual and group practical exercises.
- A multiday command post exercise.
- Subjects: terrain analysis, air defense artillery, communications, fire support planning, decision making, offensive and defensive planning and operations, command and control, airland battle, engineer support, CSS, fratricide, operations in a contaminated area, low intensity conflict, and combat orders and plans....[12]

Corrective actions are clearly under way to address the staff training problem in the institution as well as in the unit. Nevertheless, after review of TCDC and of the current state of institutional command and staff training, it seems reasonable to assert that:

- There is a substantial staff training problem.
- TRADOC is moving to correct the deficiencies.
- Potential applications of corrective action to the reserves are unknown. At present, the only training (OAR-RC) is being discontinued. The nature of the BCST "fix" for individual training at Leavenworth (CAS3) is undetermined.
- TRADOC appears to be moving to institute functional individual courses at Knox for heavy forces at least for S3s.

Based on the above, it appears prudent to initiate work on development of the BCST model for use in horizontal institutional training. In fact, given the characteristics of the BCST model (Context, Table/Module and AAR) to train Staff Task Proficiency and Battle Staff Effectiveness, it is not only useful but perhaps long overdue.

VERTICAL INSTITUTIONAL BCST

The case for BCST appears equally valid for vertical training in the institution. As Ft. Knox develops the functional course for the S3 discussed above, the necessity of

12 EMail, Norman M Shumate, Subj: Confirmation of 24 September PHONECON with John Werkman, 29 September 1992. Underlining by F.J.Brown.

vertical training in Fire Support will become evident. Opportunities for synchronization of direct and indirect fires are limited at the Battalion echelon. Institutional training of the Battalion S3 will at a minimum extend from the Company FIST to the Fire Support Officer and DS Artillery Battalion at Brigade. It should probably go higher. Resources associated with focusing combat power in Airland Battle (tactical airpower, attack helicopters and MLRS as well as cannon artillery and mortars) are controlled at least at Brigade and increasingly at Division or even Corps. So as a result of the S3 functional course, extension of institutional training into vertical BCST seems certain.

This movement should be reinforced as Ft. Knox, the proponent of armored forces in near battlespace, seeks new ways to train leaders in emerging combined arms capabilities. The Fire Coordination Exercise (FCX) was modified for institutional training at Ft. Knox some years ago because of the clear need to train mounted force officers better in synchronizing indirect fires. The FCX was analog--substitution of subcaliber for full caliber ammunition. Now, the communications capabilities of the M1A2--IVIS--enable remarkable abilities to resynchronize all ground and air direct and indirect fires on the move responding to a changing tactical situation. The FCX will become training and evaluation of commander's combined arms synchronization abilities much as Tank Combat Table, Gunnery Table VIII trains and evaluates individual tank proficiency today. Expansion of the Fire Coordination Exercise (FCX) into virtual and perhaps constructive simulation Tables and Modules seems certain to initiate the development of vertical BCST in institutional training. Hopefully, the proponent for Fire Support, Ft. Sill, will be a proactive participant in this process. Then Fire Support should be quickly followed by Intelligence reflecting vertical requirements to train the Intelligence BOS as the S2, S3, FSO small staff team postulated in BCST begins to place requirements on the training system. The Concept Based Requirements System should enable vertical BCST in the institution.

The proposed BCST does in fact appear to be the dominant solution to the institutional command and staff training challenge.

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